

# Nevada Preschool Mixed-Delivery System: Cost and Equity Study

Final Report

---

WestEd

June 2023

© 2023 WestEd. All rights reserved.

WestEd is a nonpartisan, nonprofit agency that conducts and applies research, develops evidence-based solutions, and provides services and resources in the realms of education, human development, and related fields, with the end goal of improving outcomes and ensuring equity for individuals from infancy through adulthood. For more information, visit [WestEd.org](https://www.wested.org). For regular updates on research, free resources, solutions, and job postings from WestEd, subscribe to the E-Bulletin, our semimonthly e-newsletter, at [WestEd.org/subscribe](https://www.wested.org/subscribe).



# Acknowledgements

The report and the research behind it would not have been possible without the support of the Nevada Department of Education’s Office of Early Learning and Development (NDE OELD). The collaboration, expertise, and data they provided was invaluable to the cost and equity study outcomes. WestEd would also like to thank Nevada Ready! State Pre-K (NR!PK) practitioners who participated in focus groups that provided important feedback during the initial phase of the study. The WestEd team and Region 15 Comprehensive Center research team would like to also thank members of the Nevada Early Childhood Advisory Council (NECAC) for providing essential information about their NR!PK experience, informing report analyses and recommendations. Lastly, the research team would like to express our gratitude to those who participated on the Professional Panel; each panel member greatly assisted in the development of this study’s recommendations.

Contributors to this report include Lucy Hadley, Greg Hill Jr., Mel Wylen, Brianne Dotson, Alex B. Jacobson, Reggie Ferrell, Lupita Alcalá, and Bersabell Yeshitla.

# Contents

<b>Executive Summary</b>	<b>1</b>
Cost Analysis	2
Equity Analysis	3
Recommendations	4
<b>Introduction</b>	<b>5</b>
Research Questions	6
How to Read This Report	8
<b>Data and Methods</b>	<b>9</b>
Cost Analysis	9
Equity Analysis	16
Expert Engagement	22
<b>Findings</b>	<b>25</b>
Cost Analysis	26
Equity Analysis	44
<b>Recommendations</b>	<b>60</b>
Additional Considerations	68

<b>Conclusion</b>	<b>70</b>
<b>References</b>	<b>72</b>
<b>Appendix A. Cost Study Methods</b>	<b>79</b>
<b>Appendix B. Professional Panel Protocols Questions</b>	<b>91</b>
<b>Appendix C. Accessibility Methods</b>	<b>93</b>

---

## List of Figures

<b>Figure 1. NR!PK Locations</b>	18
<b>Figure 2. Engagement Process Cycle</b>	22
<b>Figure 3. Per-Child Estimates by Case-Study Counties and Resource Category</b>	29
<b>Figure 4. Average Teacher Salaries by Case-Study County, 2021–2022</b>	38
<b>Figure 5. Per-Child Seat Cost Compared to Child–Teacher Ratio</b>	40
<b>Figure 6. Percentage of NR!PK Standard Costs Covered by NR!PK Grant in Select Regions, School Year 2022</b>	42
<b>Figure 7. Percentage of Need Met by NR!PK by County</b>	49
<b>Figure 8. NR!PK Hotspots by Site Quality in the Las Vegas Metropolitan Area</b>	56
<b>Figure 9. Income to Access in the Las Vegas Metropolitan Area by Census Tract</b>	58
<b>Figure 10. Scatterplot of Income to Access in the Las Vegas Metropolitan Area by Census Tract</b>	59

---

## List of Tables

<b>Table 1. Research Questions by Study Component</b>	7
<b>Table 2. Summary of Report Section</b>	8
<b>Table 3. Summary of Cost Analysis Data Sources by Data Category</b>	10
<b>Table 4. Description of the Required Program Elements by Domain</b>	27
<b>Table 5. Share of Estimated Costs and Average Per-Child Estimated Costs by Resource Category</b>	30
<b>Table 6. Average Estimated Costs by Component of the Personnel Resource Category</b>	31
<b>Table 7. Assumptions Underlying Personnel Cost Estimates by Specific Ingredients</b>	32
<b>Table 8. Average Estimated Costs by Component of the Facilities Resource Category</b>	34
<b>Table 9. Average Salaries by Case-Study Counties</b>	39
<b>Table 10. Source of Blended and Braided Funds for NR!PK Sites in Selected Case-Study Counties, 2021–2022</b>	43
<b>Table 11. Estimated Number and Percentage of Low-Income Children Between 4 and 5 With Working Parents by County</b>	46
<b>Table 12. Counts of Children Between 4 and 5 by Percent of Household Income Relative to Federal Poverty Level</b>	47
<b>Table 13. Percentage of Need Met by NR!PK by County</b>	50
<b>Table 14. NR!PK Accessibility in Rural Counties</b>	51
<b>Table 15. Travel Time in Minutes to NR!PK Sites by Rural County</b>	52
<b>Table 16. Straight-Line Distance in Miles to NR!PK Sites by Rural County</b>	52
<b>Table 17. Estimated Population in Rural and Urban Census Blocks by Race/Ethnicity</b>	54
<b>Table 18. Estimated Number of Low-Income Children by Selected Demographic Categories</b>	55
<b>Table 19. \$8,410 Amount Adjusted by Inflation Measures</b>	61
<b>Table 20. Common State Policies Supporting Teacher Pay Parity for Pre-K Teachers</b>	63

# Executive Summary

Nevada Ready! State Pre-K (NR!PK) is a state-funded comprehensive early childhood education program designed to provide high-quality learning opportunities for children who are 4 years old at the beginning of the school year and from families living below 200 percent of the poverty line. In fiscal year (FY) 2023, 13 subgrantees operated 96 NR!PK sites across the state, serving roughly 2,400 children. Unfortunately, more than 35,000 eligible 4-year-old and 5-year old children live in Nevada, far exceeding NR!PK's current serving capacity. In preparation to address the gap between eligible children and available NR!PK seats, the Nevada Legislative Counsel Bureau (LCB), a nonpartisan centralized agency that frees legislators from dependence upon the executive branch of state government and lobbyists for information and assistance, requested a report from the Nevada Department of Education (NDE) Office of Early Learning and Development (OELD) to better understand the current funding needs.

NDE commissioned WestEd to conduct a cost and equity study. From the cost perspective, this study reviewed and analyzed the state's current cost model using the state allocated \$8,410 per seat cost as an anchor point for preschool services within the context of the mixed-delivery system and compared it to the actual cost of meeting the program standards (See Appendix A). This study also examined the extent to which eligible families have equitable access to the NR!PK program and how various factors, such as race, ethnicity, and location, impact access.

To help validate the research, the study team convened early childhood partners to discuss initial findings and explore potential adjustments to the Nevada cost model. Doing so included engaging with two separate groups of early childhood experts: a professional panel and an advisory council. The Professional Panel consisted of decision leaders from state agencies, including an NDE director and community-based organizations. The Nevada Early Childhood Advisory Council (NECAC), a group of Governor-appointed educators who work to strengthen state-level coordination and collaboration among the various sectors and settings of early childhood programs in the state, served as the Advisory Council for this study. Each group



convened twice separately to discuss and respond to findings from the cost study and the equity and access analysis to support development of the final study recommendations.

## Cost Analysis

Understanding the funding amount, or per-child allocation, that Nevada provides for NR!PK is not the same as understanding the cost of delivering the program. The current per-student allocation amount was determined by OELD based on the total dollars (including state Zoom<sup>1</sup> and Title I funds) used for the program divided by the number of children (Solis, 2021). While this provides a rough estimate of expenditures in 2021, the current allocation amount was not calculated to cover the resources necessary to meet the NR!PK Required Program Elements and additional requirements prescribed by the Nevada Pre-K Standards, which include teacher qualifications; class size requirements; and more general guidance around program quality, including guidelines for curriculum, family engagement, and coordination with other community resource providers (NDE, n.d.).

This study used provider-level cost data and state data collections to determine the estimated price-point of meeting the standards and to assess how the \$8,410 seat cost compared to that price-point in five case-study counties: Clark, Elko, Lyon, Nye, and Washoe. Case-study counties were selected in collaboration with the NDE OELD team based on demographic and geographic characteristics important for ensuring diversity and representativeness across the state's rural, urban, and suburban populations. The research questions that guided the cost analysis portion of the study and their respective findings are described below.

## Research Questions and Findings

What is the range of cost points above and below the \$8,410 figure?

*The cost analysis estimates a range of \$7,800–\$16,600 per child in the five case-study counties. The costs for personnel and facilities account for 91 percent of the average per-child estimate.*

---

<sup>1</sup> The Zoom Program was created to support the EL population of students to attain English language proficiency and academic success. Zoom programming was a non-competitive grant distributing allocations each year based on the identified number of ELs in each of Nevada's school districts. This funding has since been integrated in the new pupil-centered funding formula.

What are the factors that create this range of costs for the requirements?

*Regional variations in salaries and the impact of enrollment on child–teacher ratios are the two primary factors associated with cost.*

What is the gap between how much Nevada spends on NR!PK-funded programs and the cost of delivering those programs under those requirements?

*In four out of the five case-study counties, the \$8,410 per-child allocation does not cover the total cost of the program and provider. On average, the NR!PK funding covers 95% percent of the cost in the case-study counties, and the gap is growing as the allocation does not keep pace with inflation.*

**In summary, case-study counties have to blend and braid different funds (Table 10) to cover the cost of NR!PK beyond the grant because the \$8,410 seat cost is insufficient to meet the Nevada Pre-K Standards in four out of five of the case study regions.**

## Equity Analysis

In addition to assessing the cost of delivering high-quality programs, this study also examined issues of equitable preschool access for Nevada’s families. This study’s equity component examined the extent to which eligible families have equitable access to the NR!PK program, with a key interest in identifying areas where needs remain unmet, particularly among the state's rural and urban populations and historically underserved communities. The research questions that guided the equity analysis portion of the study and their respective findings are described below.

## Research Questions and Findings

Who is being served by NR!PK, who is not, and why?

Demand for NR!PK far exceeds supply, leaving approximately 33,385 out of 35,866 eligible children unserved.

Location and population demographics are key factors in unmet need. For example, despite having smaller numbers of eligible families than urban (Clark and Washoe) counties, more rural counties have stark gaps in availability and access to NR!PK.

### How does access to NR!PK vary by race and ethnicity or socioeconomic status?

The gap between eligible children and available NR!PK seats disproportionately affects children from historically underserved communities and families living in rural areas.

Although levels of need vary overall, the proportion of high-need families is greater among historically underserved communities, including Black or African American and Hispanic or Latino children.

In the Las Vegas metropolitan area, access to high-quality NR!PK providers is clustered in central and northeastern neighborhoods, leaving about 20 percent of low-income children between the ages of 4 and 5 with the most significant access gaps.

In summary, less than 10 percent of eligible children are being served by NR!PK and children from historically underserved communities and families living in rural areas are disproportionately affected.

## Recommendations

The recommendations described below are considerations for system improvement, based on the aforementioned findings from the cost and equity analyses. Each recommendation is explained in further detail beginning on page 62.

**Recommendation 1:** Tie NR!PK funding to inflation to maintain purchasing power

**Recommendation 2:** To improve teacher pay parity, provide funding and improve monitoring of NR!PK teacher compensation

**Recommendation 3:** Allocate additional funds to support non-local education agency (LEA) NR!PK sites

**Recommendation 4:** Expand access to early information on NR!PK funding allocations when possible

**Recommendation 5:** Address transportation challenges for families

**Recommendation 6:** Cultivate local talent, education and training opportunities, and entrepreneurship

**Recommendation 7:** Incentivize expanded operation and service hours for NR!PK providers

# Introduction

In 2015, Nevada received a federal Preschool Development Grant (PDG) to expand its state prekindergarten (pre-K) program. The result of this effort is the Nevada Ready! State Pre-K (NR!PK), a state-funded, prekindergarten program for 4- and 5-year-olds. In the fall of 2021, WestEd partnered with the Nevada Department of Education (NDE) Office of Early Learning and Development (OELD) to assess the costs of NR!PK and the extent of equitable access to the program.

Since 2001, Nevada has funded a comprehensive early childhood education program implemented through competitive grants to school districts and community-based organizations. From fiscal year (FY) 2001 to 2010, program funding was sustained and ranged from \$2.6 to \$3.5 million annually until it was flat-funded at \$3.3 million beginning in FY 2010. Nevada used the federal PDG funds beginning in FY 2015 to expand the state's pre-K program. In FY 2019, following the PDG-funded expansion, the Legislature awarded \$19 million to sustain the additional seats. Also, in FY 2019, the Legislature passed SB 84, which established requirements for the NR!PK program codified in NRS 387.652.<sup>2</sup>

The NR!PK program is guided by the Nevada Early Childhood Advisory Council's (NECAC's) vision:

---

<sup>2</sup> Information about SB 84, including the full text of the bill, can be found at <https://www.leg.state.nv.us/App/NELIS/REL/80th2019/Bill/6027/Overview>. The full text of NRS 387.652 can be found at <https://www.leg.state.nv.us/nrs/nrs-387.html#NRS387Sec652>.

---

*“Nevada’s children will be safe, healthy, and thriving during the first eight years of life, and the system will support children and families in achieving their full potential.”*

---

The NR!PK program has detailed required elements, or standards, organized within 10 categories. Overall, because of the PDG expansion, these elements increased program quality requirements, including teacher credentialing and minimum per-day service hours.

In the 2021–2022 school year, the state invested approximately \$21.4 million in direct per-child allocations to NR!PK sites (NDE, 2021), which translated to services for 2,385 students at a per-child grant allocation of \$8,410. With respect to the program scope, as of FY 2023, 13 subgrantees operated 96 NR!PK sites across the state.

## Research Questions

The partnership between WestEd and OELD to conduct a cost and equity study included several aims. First, the study sought to understand the cost of providing prekindergarten programs through NR!PK. In 2022-23, Nevada had approximately 35,866 eligible 4- and 5-year-old children and funded 2,481 NR!PK seats. To meet the demand for quality childcare for children and families, Nevada must have a clear estimate of the cost to meet the state’s program requirements. This estimate will allow for an assessment of the sufficiency of the current per-child allocation, and it can inform any required planning to ensure that Nevada’s anticipated growing need can be met. For this purpose, the study team used provider-level cost data, state data collections, and national price data to assess how the \$8,410 seat cost matched the current program design and local cost factors in five case-study counties. In collaboration with the NDE OELD team, the team studied five counties, Washoe, Nye, Lyon, Elko, and Clark, based on demographic and geographic characteristics important for ensuring diversity and representativeness across the state’s rural, urban, and suburban populations.

Second, the study examined equitable access to NR!PK for Nevada families. When conditions support equity and access, program benefits can be considerable. Research shows that participation in early childcare and education can lead to higher academic achievement and degree attainment and lower rates of behavioral issues and encounters with the legal system

(Gray-Lobe et al., 2022; Meloy et al., 2019). There are also economic benefits. Most parents and caregivers work and, for many, access to childcare is critical for sustained participation in the labor force (OECD, 2022). Also, children who participate in early childcare have been shown over the long term to have higher employment rates and lower participation rates in the welfare system (Garcia et al., 2016; Sparling et al., 2019). This study’s equity component examined the extent to which eligible families have equitable access to the NR!PK program, with a key interest in identifying areas where needs remain unmet, particularly among the state's rural and urban populations and historically underserved communities.

Finally, the study team convened early childhood partners to discuss initial findings and explore potential adjustments to the Nevada cost model. Doing so included engaging with two groups of early childhood experts: a professional panel and an advisory council. The Professional Panel consisted of decision leaders from state agencies, including an NDE director and community-based organizations. The Nevada Early Childhood Advisory Council (NECAC), a group of Governor-appointed educators who work to strengthen state-level coordination and collaboration among the various sectors and settings of early childhood programs in the state, served as the Advisory Council for this study. Each group convened twice separately to discuss and respond to findings from the cost study and the equity and access analyses to support the development of final study recommendations.

Table 1 outlines the study research questions alongside the most applicable component of the study.

**Table 1. Research Questions by Study Component**

Research Questions	Study Component
<ol style="list-style-type: none"> <li>1. What is the range of cost points above and below the \$8,410 figure?</li> <li>2. What are the factors that create this range of costs for the requirements?</li> <li>3. What is the gap between how much Nevada spends on NR!PK-funded programs and the cost of delivering those programs under those requirements?</li> </ol>	<p>Cost Analysis</p>
<ol style="list-style-type: none"> <li>4. Who is being served by NR!PK, who is not, and why?</li> <li>5. To what extent does access to NR!PK vary with respect to race and ethnicity or socioeconomic status?</li> </ol>	<p>Equity and Access Analysis</p>

Research Questions	Study Component
<ul style="list-style-type: none"> <li>6. What challenges are providers facing that might impact the cost of providing the NR!PK program?</li> <li>7. What additional information or analyses could inform potential NR!PK funding policy adjustments?</li> <li>8. What factors might affect access and use of NR!PK among families in rural and urban communities, respectively?</li> <li>9. What information might support the design and implementation of policies that increase equitable access to NR!PK, particularly for historically underserved communities?</li> </ul>	<p>Expert Engagement</p>

## How to Read This Report

The main body of this report has three main sections, described in Table 2, along with technical appendices providing additional information and study artifacts.

**Table 2. Summary of Report Section**

Section Title	Description
<p><b>Data and Methods</b></p>	<p>A summary of the data accessed and reviewed as part of the study and of the methods used to address the study research questions</p>
<p><b>Findings</b></p>	<p>An overview of the key findings organized into the two analyses: cost and equity</p>
<p><b>Recommendations</b></p>	<p>A summary of the study recommendations and other considerations for system improvement, based on the study findings</p>

# Data and Methods

This section of the report describes the data accessed and analyzed for the study and the methods used to address the study research questions. The subsections are organized around the key components of the study described in the Introduction.

## Cost Analysis

The cost analysis component of the study used the best available data and current standards in economic evaluation to estimate the cost of meeting NR!PK program requirements in several regions and settings.

## Data Sources

The cost analysis used data from various sources including state, national, and federal data collections, and market data from applicable retailers.

The first group of data sources included state budget data and student enrollment counts provided by OELD. The study team used these data to assess budgeted allocations of NR!PK funds and to determine program size as reflected by enrollment. Information that defined the NR!PK Required Program Elements and described fees or additional requirements was extracted from various NDE web pages. This information was used as the primary source of NR!PK standards for which costs were estimated.

In addition to state data, the study team also used several national sources to identify and assign a value to the resources that reflect their typical price in an open market. This estimation approach is important because it provides a replicable data source for the parts and total sum of costs not otherwise accounted for.

Finally, without data from national price databases, the study team used prices reported by applicable retailers to generate estimates for several resource categories, including materials



and equipment and professional development opportunities. Table 3 summarizes the relevant data sources.<sup>3</sup>

**Table 3. Summary of Cost Analysis Data Sources by Data Category**

Data Source	Data Category
American School and University Maintenance and Operations Cost Study	National/Federal
Cost Analysis in Practice (CAP) Cost of Facilities Calculator	National/Federal
Database of Prices of Educational Resources (DPER)	National/Federal
Early Childhood Environment Rating Scale (ECERS) III	National/Federal
ePage Budget and Grants System	State
National School Public Finance Survey – National Center for Education Statistics (NCES)	National/Federal
NDE State Licensure Fees <sup>a</sup>	State
Nevada Pre-K Standards <sup>a</sup>	State
NR!PK Required Program Elements <sup>a</sup>	State
Online and National Retailers (including Amazon, 2022; Kaplan, 2022; Lakeshore Learning, 2022; Oriental Trading, 2022)	National Retailer
Nevada Registry -Approved Professional Development Providers <sup>a</sup>	National Retailer
State NR!PK Enrollment Data	State
State Pre-K Financing Data	State

<sup>3</sup> WestEd also conducted several focus groups and interviews in the summer of 2022 to collect cost information directly from NR!PK providers. However, participation in these events was low and not representative of the range of NR!PK contexts across the state. As a result, the study team decided not to generalize these data across the state. However, qualitative data from these engagements is used throughout this report to provide the practitioner perspective.

Data Source	Data Category
Teacher Salary Data – NCES	National/Federal
Teacher Salary Data – Nevada Registry	State
Teaching Assistant Salary Data – Bureau of Labor Statistics (BLS)	National/Federal

<sup>a</sup> These data sources are directly from an applicable NDE webpage.

## Methods

Key methods applied in the cost analysis are described below, organized by the approach used for identifying the sample of case-study counties, key decisions about applying economic evaluation best practices to address study research questions, and key assumptions made in the estimation process.

### Case-Study County Selection

To address the cost research questions, the evaluation team focused on five case-study counties: Clark, Elko, Lyon, Nye and Washoe.<sup>4</sup> These counties were selected with NDE OELD based on demographic and geographic characteristics important for ensuring diversity and representativeness across the state’s rural, urban, and suburban populations.

The following factors informed the selection of counties:

- Demographic and Economic Characteristics:** These characteristics included the demographics and socioeconomic status of the local community, as well as changes in that local population. This ensured representation and equity of voice.
- Geographic Representation:** The study team and NDE OELD agreed to include case-study counties that captured the geographic variation of Nevada, including representation of rural and urban counties and a distribution that includes most geographic regions of the state (i.e., north, south, east, and west). Since local prices tend to vary between counties, ensuring geographic diversity was important to illuminate cost variation.

---

<sup>4</sup> Initially, the case-study package consisted of three counties (Elko, Lyon, and Nye) and the state’s two major urban centers, Las Vegas and Reno. Because very few sites in Clark and Washoe counties are outside of the metro areas, and because of the greater availability of county- rather than metro-area-level data, the study team chose to look at all case-study counties at the county level.

- **Pre-K Access and Capacity:** The study team and NDE OELD also considered data on access to and uptake of pre-K services, including data on the unmet need for NR!PK services, defined as the number of children in a county enrolled in NR!PK divided by the total number of children eligible for the program (i.e., those from families living below 200 percent of the poverty line). This factor may have implications on classroom size and the number of participating providers; therefore, including counties with differing levels of access and need was also important.

Considering these factors, the final selection process consisted of a collaborative discussion between NDE OELD and the study team anchored in the data described above. NDE OELD added context based on their understanding of the communities and NR!PK providers in each region. Ultimately, the counties were purposefully chosen through this collaborative approach to balance the aforementioned factors.

With most (76 percent) of the state’s NR!PK children living in Clark and Washoe, it was essential to include these counties. Additional counties were then selected to account for rural and regional variation. Elko was selected due to its mining industry, which has unique implications for the teacher workforce and the cost of living. Nye and Lyon counties rounded out the central and western regions of the state and represented rural settings. These counties also contain LEA and non-LEA sites respectively, and both have an appropriate mix of rural and suburban communities that balance the urbanicity of Clark and Washoe.

The study team planned to include tribal lands and governments in this study; however, there are no NR!PK sites on tribal lands or operated by tribal governments. Importantly, this report does not reflect tribal community equity and access issues.

### Applying Economic Evaluation Methods

The study team anchored its cost analysis in the latest standards for economic evaluation most closely associated with the ingredients method and outlined by the Cost Analysis Standards Project (2021). This method is the widely accepted standard for cost analysis and generally proceeds in stages.

The first stage entails identifying the resources, or ingredients, required for the program. This ingredients list is developed by reviewing program documentation (e.g., descriptions, standards, statutes, etc.) in combination with qualitative information from practitioners. In the second stage, a quantity for every ingredient is estimated, a resource value (i.e., price) is

assigned, and an estimated total cost is calculated (the product of quantity and price).<sup>5</sup> In the final stage, the resulting estimated costs are reported after additional adjustments are applied to some ingredients as necessary (e.g., adjustments to account for inflation, etc.).

In addition to this general process, there are methodological considerations when defining the scope of this analysis. Cost analysts typically estimate the cost of a program for an observed implementation period (i.e., over the course of a school year, etc.), often at multiple sites. This estimate requires extensive information about that implementation and its associated resources (e.g., personnel, equipment, etc.).

Analysts typically rely on extensive practitioner interviews to acquire comprehensive information about program resource use. In this process, it is best practice for the engagements to include practitioners representing the full spectrum of program implementation and diversity of sites. Unfortunately, the estimated costs described in this report are limited to the information available in the NR!PK Required Program Elements, as relatively few additional information sources of information are available.

The study team attempted to collect more comprehensive practitioner information through a survey and engagements; however, these efforts did not yield reliable program cost estimations.<sup>6</sup> Nonetheless, the engagements provided qualitative data on the current cost model that is referenced throughout this report.

Given these limitations, the study team chose to provide cost estimations of the current NR!PK requirements at current enrollment levels in the five case-study counties. Thus, instead of observed (i.e., actual current) costs, the study team estimated the cost to put state requirements into practice in different settings. With this approach, resources are the same across providers (except for a few slight differences between LEA and non-LEA providers). Therefore, enrollment and regional cost variations drive cost differences, not district resource allocation choices or hiring preferences.

In general, these estimated costs were compared to the per-child seat cost of \$8,410 to assess the gap between current funding and current costs. Where possible, this study also compared

---

<sup>5</sup> Generally, a market price, or the value that a good or service would fetch under current economic conditions on the open market, is assigned. In this study, prices are generally state averages adjusted for county variation, obtained and calculated through government or industry data sources.

<sup>6</sup> In particular, low participation in the survey and engagements resulted in data insufficiently representative of the overall target population.

the estimates to observed (actual) NR!PK cost data to provide detail about current local cost pressures.

In summary, the analysis estimated the cost of adhering to the current NR!PK requirements, while providing additional information on the current costs of program implementation. This approach allows policymakers, NDE OELD staff, and NR!PK educators to understand the required NR!PK resources, and, as a result, make allocation decisions based on providing sufficient funding to cover these costs.<sup>7</sup>

### Key Assumptions

Finally, the cost analysis required making a few key assumptions about the value of each resource in the NR!PK program requirements, or the price.

### Price Identification

The study team determined each resource’s dollar value—or price—for estimated costs. For example, the price for a staff position reflects a typical level of compensation, including salary and benefits.<sup>8</sup>

Choosing an appropriate price for a given staff position first depends on understanding its characteristics, including key responsibilities and minimum qualifications, so that it can be compared to a similar role in a publicly available price dataset. Similarly, identifying a price for a non-staff resource requires understanding its characteristics as it is used in the program. For NR!PK, these characteristics are mainly defined by the NR!PK Required Program Elements, which describe a baseline for staff and non-staff resources (for example, minimum teacher qualifications).

### Price Assumptions

Depending on the scope and context of a given project, cost analyses may report local or national prices. Specifically, local prices reflect the typical value of a resource within a specific geographic context—in this case Nevada. In contrast, national prices reflect a value standard

---

<sup>7</sup> The NR!PK program is treated by the study team as a supplementary (add-on) program and therefore total cost and incremental costs are considered to be the same. In other words, the study team is assuming that NR!PK and its associated costs are added on top of the cost of business-as-usual educational programming.

<sup>8</sup> Following best practice in cost analysis, market price was used (rather than actual price reported by providers) to understand the price this role would fetch in the labor market outside of this program. Using the market price has the advantage of capturing the value of the role divorced from hiring preferences of the district or differences in staff qualifications at a given site relative to the minimum required qualifications.

across the country. Researchers may choose the former if the regional variation is important or the latter if prices will be compared to interventions in multiple state contexts.

For this project, the study team chose primarily local prices, as the study sought to examine cost in Nevada and variation by county. Nonetheless, there are some instances where national and local prices are equivalent. For example, learning materials from national online retailers are the same for all communities.

To account for regional cost variation, the study team identified additional sources and procedures, including the following:

- **Facilities:** To adjust for regional differences in the cost of space rentals, the study team generated and applied an index with values for each case-study county, representing county costs as a percentage of the state average (U.S. Department of Housing and Urban Development, 2022).
- **Inflation:** To account for inflation, the study team adjusted prices that were not for the 2022 school year using the Consumer Price Index (CPI) (BLS, 2022).
- **Labor – Teachers:** To account for regional differences in the price of teacher labor, the study team adjusted state averages for teachers and teacher assistants using the county-level Comparable Wage Index for Teachers (CWIFT) (Cornman et al., 2019).
- **Labor – Other:** For other labor prices (such as maintenance staff), the study team adjusted for county variation using a salary data index generated by the American Community Survey (U.S. Census Bureau, 2020).

Appendix A describes the specific adjustments for each ingredient.

In addition, if a resource had a lifespan beyond a single year, some assumptions were assigned an annual price. Specifically, facilities were assumed to have a 30-year lifespan and equipment was assumed to have a 5-year lifespan (AIR, 2021).

## Limitations

As previously described in the Key Assumptions section, readers should consider several limitations related to the data and scope of this analysis.

Publicly available, centralized financial data on NR!PK is limited. ePage, the state's grant management system, has budget information on resources funded through the NR!PK grant, but primarily for LEA-operated sites. Data for non-LEA sites generally only shows the amount

the subgrantee uses (e.g., United Way) for administration and the direct provider passthrough amount.<sup>9</sup> Data on other financing streams (for example, IDEA or Title I) are available on ePage but the portion that is used for NR!PK is not broken out. In other words, there is currently no data source with comprehensive NR!PK expenditure information across providers and funding streams.

This type of data could provide detailed information on the resources currently required to implement the program. Without a comprehensive source of expenditure data, the study team relied on program requirements to define the resource ingredients and their characteristics and quantities for the cost analysis.

Similarly, cost analyses frequently use practitioner engagements to obtain detailed cost information. The study team relied on program requirements due to low survey response rates and lack of response to interview invitations. Without this detailed information, the study team made certain assumptions, for example, about the staff time required for family engagement (See Appendix A).

As a result of these data limitations, the study results should be interpreted as estimates of the *current NR!PK cost requirements* not the current program cost. This distinction is important if NR!PK providers offer services short of or beyond the program requirements in a manner which increases or decreases their costs. For example, this report's Salaries and Recommendations sections describe how providers do not meet the teacher salary requirements laid out in the NR!PK Required Program Elements. Thus, in some areas, current teacher costs are likely lower than those reported here. However, this analysis helps policymakers and providers understand the resources required to meet the current NR!PK program standards and guidance.

## Equity Analysis

The study's equity analysis component used the best available data and sophisticated geospatial analysis techniques to examine which eligible families have equitable access to the NR!PK program.

---

<sup>9</sup> Great Basin College is an exception to this. The site's ePage data included the more detailed budget.

## Data Sources

The equity analysis used data from various sources, including state, national, and federal data collections. First, OELD provided NR!PK site and licensing data. The research team used key variables, including site location; eligible enrollment—a capacity proxy; and a Quality Rating and Improvement System (QRIS) rating—a quality proxy. Figure 1 illustrates the NR!PK locations based on site data.

Also, OELD provided child-level demographic data from the 2019 school year, the last year of data collection. These data include each participant’s age, race and ethnicity, English language proficiency and home language, and site enrollment.<sup>10</sup>

Population data were drawn from U.S. Census 2020 Decennial data and 2016–2020 5-year American Community Survey Estimates (ACS), both published tables and Public Use Microdata Samples (PUMS). PUMS data were used to estimate the population of eligible children, defined as those between the ages of 4 and 5 in households with a 12-month median income of less than 200 percent of the federal poverty level.<sup>11</sup> Estimates were then interpolated to census blocks using counts of children under 5 years old from the 2020 Decennial Census as a weighting variable.<sup>12</sup>

To address issues of geographic dispersion within block groups, 2021 nighttime LandScan data from Oak Ridge National Laboratory were used to create a population-weighted centroid for each block group. The study team used these centroids to calculate distance and travel-time estimates to and from NR!PK providers, and ultimately, evaluate levels of access.

---

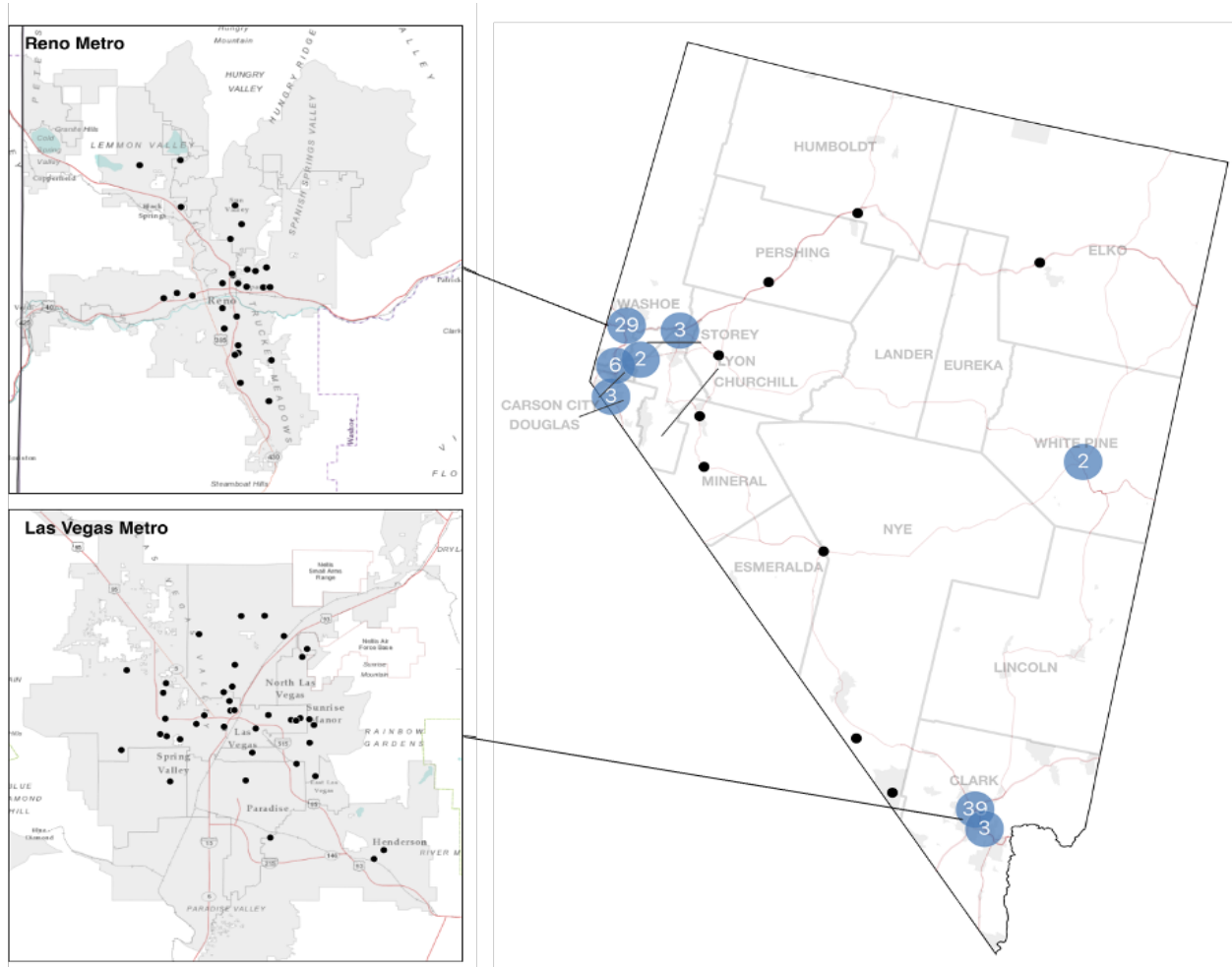
<sup>10</sup> These data were matched against current providers in the 2022 school year to serve as a proxy for current participant demographics.

<sup>11</sup> The set age range was based on input from OELD, and the income threshold was established by state policy. These data exclude children who reside in group homes or other managed facilities.

<sup>12</sup> In testing different weighting variables, including block-level population and block-level housing, the study team found that using a variable similar to the one that the team sought to interpolate yielded results that better approximated values in ACS-published tables.



Figure 1. NR!PK Locations



## Methods

To assess equity and access to NR!PK, the study team applied geospatial analysis techniques to analyze participation and site-level enrollment. The analysis examined participation and site-level enrollment in Nevada’s rural and urban areas. Next, the study team examined potential racial disparities in NR!PK access in rural and urban areas and then overall in Nevada’s major metropolitan areas. Descriptions of the key methods applied in this analysis are described below.

### Estimating NR!PK Accessibility

At the county level, the primary measure of access is the proportion of available seats to eligible children, typically expressed as a ratio of supply and demand, or percentage of need met. Within counties, accessibility is calculated using an enhanced two-stage floating

catchment area (E2SFCA) method. While the E2SFCA method is commonly used in analyses of access to healthcare (Guagliardo, 2004; Luo & Wang, 2003) and urban green spaces (Li et al., 2016), its use in early childhood education accessibility analyses is relatively new (Davis et al., 2019; Kawabata, 2015; Lin & Madill, 2019). The E2SFCA approach provides a useful model for analyzing accessibility in early childhood education. It integrates supply (number of available seats) and demand (number of children requiring seats) within a defined geographic catchment area based on travel time or distance, rather than arbitrary administrative boundaries.

As a first step in the E2SFCA method, catchment areas are delineated around point locations representing where families with eligible children live. Catchment areas were based on distance and travel time, depending on whether the area was urban or rural, and the unit of analysis was primarily the census block group. Block groups are the second smallest geographic unit for which the U.S. Census provides population estimates, each generally containing between 600 and 3,000 people. However, they can be much larger in population-dense areas. To apply the E2SFCA method using aggregated data (such as census data), a single, nominal center of gravity (centroid) needed to be defined for each neighborhood / geographic unit (i.e., census block, block group, or tract). To this end, the study team used 2021 nighttime LandScan data to calculate weighted centroids, allowing the study team to position centroids closer to population centers instead of geographic units' geometric centers, which could be several miles from where the majority of the population resides.

In the second step, catchment areas are set up based on the same criteria as those for the populations being studied. These areas were then overlapped with the ones defined in the first step, creating a matrix with capacity-to-population based on the areas that intersect. Since families usually prefer to go to service providers that are closer to their homes (a phenomenon known as “distance decay”), these ratios were then fine-tuned using an impedance function based on the Gaussian (or Normal) probability distribution that smoothly and continuously gives higher priority to sites closer to where families live and lesser priority to sites near the outer edges of the service area. These adjusted ratios are then aggregated for each geographic unit, providing an accessibility score that can be used to compare relative access across geographic areas. Appendix C shows how the research team implemented the E2SFCA approach.

### *Defining Catchment Areas*

Since county population density varies widely in Nevada, this study defined catchment areas differently for rural and urban areas. Sites in urban areas used a three-mile radius based on findings from the 2019 National Survey of Early Care and Education Project (NSECEP, 2022). NSECEP found most families have some form of childcare within three miles of home, which is also roughly equivalent to the average distance families travel for childcare (NSECEP, 2022).

The research team applied the same for rural areas but used a travel time threshold of 20 minutes. The 20-minute threshold approximated the average travel time from census block group population centers to provider sites. Conveyal's R5 routing engine, a web-based tool that calculates travel distance and time based on multiple combinations of origins and destinations, provided travel-time data.

Finally, catchment areas were confined to county (school district) boundaries as NR!PK policy does not allow families to enroll at provider sites outside their home school districts.

### *Hotspot Analysis*

Because this study sought to identify where access to NR!PK may be higher or lower by community demographics, the study team conducted a hotspot analysis, which is a technique used to statistically identify regions (hotspots) featuring high concentrations of specific attributes or phenomena. This type of analysis can help reveal significant spatial patterns, such as clustering or anomalies, that may not be immediately visible through simple observation.

The Getis-Ord  $G_i^*$  statistic is a spatial autocorrelation metric for hotspot analysis. It offers a z-score to gauge the deviation of a geographical feature from its neighbors, and a p-value for measuring statistical significance. A neighborhood is a significant hotspot if it has a high proportion of a specific demographic, for example, Latino or Hispanic children, surrounded by areas with similar demographics. If the p-value is below 0.05, it is deemed statistically significant, that is, not likely to be the result of random chance. Hotspots have statistically significant positive z-scores, while cold spots have statistically significant negative z-scores.

To compare access levels across population segments, spatial accessibility ratios were first calculated using the E2SFCA method, both overall and relative to program QRIS quality ratings. Sites rated 4 and 5 were classified as "High Quality"; sites below 4 or that were unrated were classified as "Not High Quality/Not Rated."  $G_i^*$  was then calculated based on the accessibility score to identify areas with statistically significant access to NR!PK.

The Gi\* statistic was then applied to population data from the U.S. Census. Specific data points were median income, counts of individuals identifying as Black or African American, counts of individuals identifying as Latino or Hispanic, and the estimated number of limited-English<sup>13</sup> households within the study area. These data were then compared with the accessibility ratios from the first step results to see the level of overlap between areas with high or low access to NR!PK and the communities of interest. Findings from these comparisons are presented for the Las Vegas and Reno metropolitan areas and for Carson City.

## Limitations

Several important limitations exist to the equity and access analysis presented in this report. Because this analysis focused on NR!PK, it did not factor in supply from non-NR!PK providers. This is particularly important since NR!PK comprises approximately 15 percent of licensed providers in the state. The purview of NR!PK is also relatively narrow, focusing exclusively on families below 200 percent of the federal poverty guideline threshold. While differential access likely extends to families above or slightly above 200 percent of the federal poverty line, the study team did not fully explore whether those assumptions held. Consequently, care should be taken in extrapolating these findings and applying them to other state subsidy programs or access to prekindergarten as a whole.

Because the study team could not access information about individual families, the team made assumptions about family characteristics and geographic dispersion. While nighttime LandScan data helped provide a mechanism for estimating family locations within census block groups, LandScan data do not differentiate between residential and commercial areas. Though points showing zero population estimates or residential housing were excluded, families may or may not reside at some of the specific locations identified or in the proportions estimated using LandScan population counts. Also, with U.S. Census data, the more granular the data, the greater the uncertainty (margin of error) in Census estimates.

Additionally, the analysis assumed all eligible families want access to NR!PK, which may inflate demand. Likewise, given the lag between releases by the U.S. Census, it cannot be assumed that demand estimated using 2020 data is necessarily equivalent to current demand. Finally, this analysis did not explicitly address disparities in access in tribal areas, nor did it consider

---

<sup>13</sup> Limited English households refers to households where English is not the primary language spoken in the home.

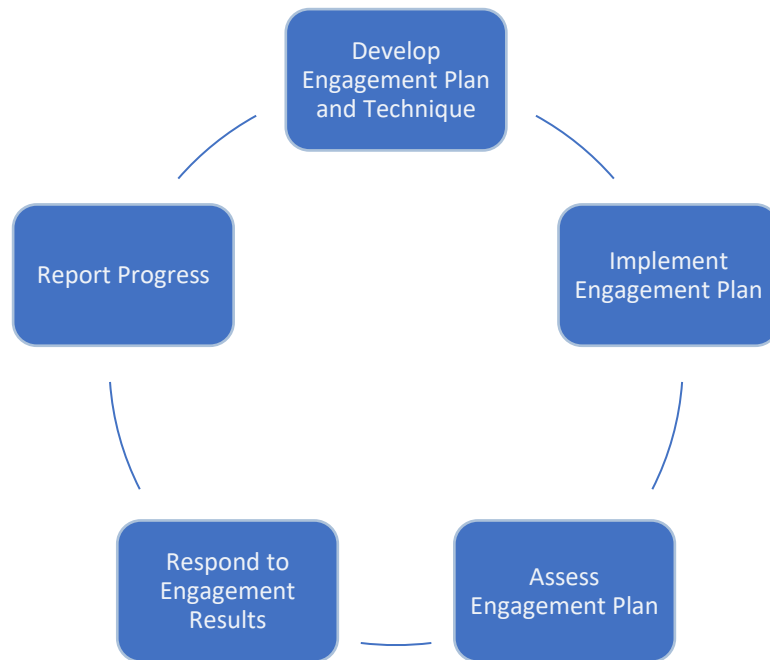
family-side factors related to whether and where parents and caregivers choose to enroll their children in pre-K.

## Expert Engagement

### Methods

In collaboration with NDE OELD, the study team codesigned an engagement process aligned with the needs of the cost analysis and the equity and access analysis (Figure 2). The engagement plan identified convenings with two groups of experts, the Advisory Council and the Professional Panel to validate the study’s quantitative analyses.

**Figure 2. Engagement Process Cycle**



Next, appropriate NR!PK professionals were identified to review the initial cost and equity findings. Participants were identified based on their NR!PK historical knowledge and expertise. The NECAC was selected as the Advisory Council because of its charge to strengthen state-level coordination and collaboration among the various sectors and settings of Nevada early childhood programs. The Governor of Nevada appoints members of the NECAC. OELD selected the Professional Panel participants, which included policy leaders from the NDE, other state agencies, and community-based organizations.

Throughout the engagement process, the study team assessed learning outcomes and activities and responded to engagement results by revising engagement practices and incorporating participant responses into the study’s analysis. After each engagement, the study team conducted a theming analysis to report engagement progress to OELD.

The following subsections provide an overview of engagements with each of these groups.

### Advisory Council

In collaboration with the Region 15 Comprehensive Center, WestEd presented the initial NR!PK cost and equity findings in two presentations to the Advisory Council in early 2023. Close to 50 early childhood practitioners from across Nevada attended each presentation. During the first convening in January, the Advisory Council reviewed the interim NR!PK cost study findings and the following questions were considered:

1. What challenges are providers facing that might impact the cost of providing the NR!PK program?
2. What additional information or analyses could inform potential NR!PK funding policy adjustments?

At the second convening in March, WestEd presented initial equity findings and asked the following questions:

1. What factors might affect access and use of NR!PK among families in rural and urban communities, respectively?
2. What information might support the design and implementation of policies that increase equitable access to NR!PK particularly for historically underserved communities?

### Professional Panel

WestEd held two convenings of the Professional Panel in early 2023 to present the initial NR!PK cost and equity findings. Seven Nevada early childhood providers attended the first Professional Panel in January, and four attended the second in April.

Panel members were presented with protocol questions (Appendix B) used to gather qualitative data on their experiences as NR!PK practitioners and their perspectives on the cost and equity of the NR!PK program.

Data collected during the two Professional Panel sessions supported a theming analysis that the study team used to identify findings and to help develop the report’s overall recommendations.

## **Limitations**

As with all studies, the current study’s design has limitations. One limitation of this study was timing. Engagements were scheduled during Nevada’s legislative session, making it difficult for participants to participate, resulting in a small sample size, specifically for the Professional Panel. To address this limitation, the study team offered both synchronous and asynchronous alternatives to Professional Panel participants.

Additionally, due to the selection criteria for Advisory Council and Professional Panel participants, the study team does not assume they represent the entire range of NR!PK perspectives and experiences.

Despite these limitations, the study team gathered information from both groups of professionals to inform the cost analysis, the equity analysis, and the study’s recommendations.

# Findings

The study findings for the cost and equity analysis are summarized below and described in more detail in the following subsections.

## Cost Analysis

1. The cost analysis estimates a range of \$7,800–\$16,600 per child in the five case-study counties. The costs for personnel and facilities account for 91 percent of the average per-child estimate.
2. Regional variations in salaries and the impact of enrollment on child–teacher ratios are the two primary factors associated with cost.
3. In four case-study counties, the \$8,410 per-child allocation does not cover the total cost of the program and provider. On average, the NR!PK funding covers 95 percent of the cost in the case-study counties, and the gap is growing as the allocation does not keep pace with inflation.

## Equity Analysis

1. Demand for NR!PK far exceeds supply, leaving approximately 33,385 out of 35,866 eligible children unserved.
2. Location and population demographics are key factors in unmet need. For example, despite having smaller numbers of eligible families than Clark and Washoe counties, more rural counties have stark gaps in availability and access to NR!PK in comparison with urban counties.
3. Although levels of need vary overall, the proportion of high-need families is greater among historically underserved communities, including for Black or African American and Hispanic or Latino children.



In the Las Vegas metropolitan area, access to high-quality NR!PK providers is clustered in central and northeastern neighborhoods, leaving about 20 percent of low-income children between the ages of 4 and 5 with the most significant access gaps.

Input from the expert engagement process is embedded in each subsection. The process gathered input on the initial results of the primary analyses and informed analyses adjustments.

## Cost Analysis

WestEd conducted a comprehensive assessment of how current NR!PK funding—an \$8,410 per-child allocation in the 2021–2022 school year—compares to the cost of meeting the program requirements. This section covers the study team’s analysis of the state’s current cost model, including (1) what meeting NR!PK requirements costs, (2) how costs vary by specific program setting, and (3) what factors drive this variation.

In the 2021–2022 school year, the state invested roughly \$21.4 million in the program (NDE, 2021), translating to NR!PK services for 2,385 students, with a per-child seat allocation of \$8,410 (NDE, 2021; OELD, 2022).

The NR!PK program is operated as a mixed-delivery system, where the program is offered in several types of settings including neighborhood schools, nonprofits, colleges, and private centers. However, despite the many types of settings, most children (76 percent) are served in nine LEAs. Community-based organizations such as The United Way, Community Services Agency, and Great Basin College primarily serve the remaining children.

Regardless of the setting, NR!PK program funding is fixed at a per-child seat cost of \$8,410. Before each school year, providers receive this amount per child *projected* to be enrolled. The projected enrollment amount serves as a maximum number of seats, so providers receive no additional funding for enrollment above the projected amount.

Importantly, the NR!PK funding amount Nevada provides is not equal to the cost of program delivery. Moreover, the seat cost is not based on the cost to meet the NR!PK Required Program Elements and additional requirements prescribed by the Nevada Pre-K Standards. Specifically, these elements include teacher qualifications; class size requirements; and general program quality guidance including curriculum guidelines, family engagement, and coordination with other community resource providers (NDE, n.d.).

Ultimately, to meet its goals and ensure broad access to public pre-K, Nevada must have a precise calculation of the current funding needs, defined in this report as the difference between the cost to meet the current NR!PK requirements and the funding currently provided by the state’s cost model.

### NR!PK Required Program Elements

A comprehensive understanding of the required NR!PK resources relies primarily on a detailed account of what the Required Program Elements describe. Prescribed by NRS 387.652-658, these elements set guidelines for program implementation and child experience and describe how providers should implement NR!PK. These guidelines cover the following domains: personnel, facilities, equipment and materials, and student nutrition (detailed in Table 4.) Some domains are more detailed than others and may reference other statutes or guidelines to give detail to the requirements. For a few select domains, in the absence of enough information to list the ingredients required, the study team made assumptions to fill in the gaps (detailed in Appendix A).

**Table 4. Description of the Required Program Elements by Domain**

Program Element	Description
<p><b>Personnel</b></p>	<p>The Required Program Elements (required by NRS 387.652-658) describe teacher qualifications, as well as student–teacher ratios and length of the program day, which collectively imply a particular number of teachers.</p> <p>The NR!PK Required Program Elements also define family engagement, coordination with community supports, and data and assessment responsibilities. NRS 387.656 requires that the State Board of Education further define these activities (R068-22A, 2022).</p> <p>NR!PK-funded programs must also adhere to the Nevada Pre-K Standards, which set general guidelines around the educational and developmental goals of all state-funded pre-K in Nevada, and learning standards that educators should focus on to support children’s transition to kindergarten.</p>
<p><b>Facilities</b></p>	<p>Neither the Required Program Elements nor the Nevada Pre-K Standards outline specific facility requirements. To create a proxy, the study team used Nevada Childcare Licensing requirements for the size of the classroom and outdoor space size.</p> <p>Specific furniture (except of activity-based kinds of furniture, such as dress-up closets, which are defined by the Early Childhood Environment Rating Scale (ECERS) III and included in equipment and materials) are also not defined by NR!PK Required Program Elements or the Nevada Pre-K Standards. Without an enumerated list of furniture</p>

Program Element	Description
	<p>required by the program, national prices for the cost of pre-K-classroom furniture were used.</p> <p>Outdoor playground and flooring space is described by the Early Childhood Environmental Rating Scale (ECERS) III and aligns to the space and shade requirements set forth by Nevada Childcare Licensing requirements.</p>
<p><b>Equipment and Materials</b></p>	<p>The NR!PK Required Program Elements do not specify all the equipment required. However, sites must participate in the state’s QRIS. QRIS has specifications for equipment and materials that the ECERS III defines.</p>
<p><b>Student Nutrition</b></p>	<p>The NR!PK Required Program Elements do not describe meals. However, the Nevada Pre-K Standards require a healthy breakfast or lunch.</p>

The following subsections detail the study team’s estimations of meeting these requirements and describe the calculation.

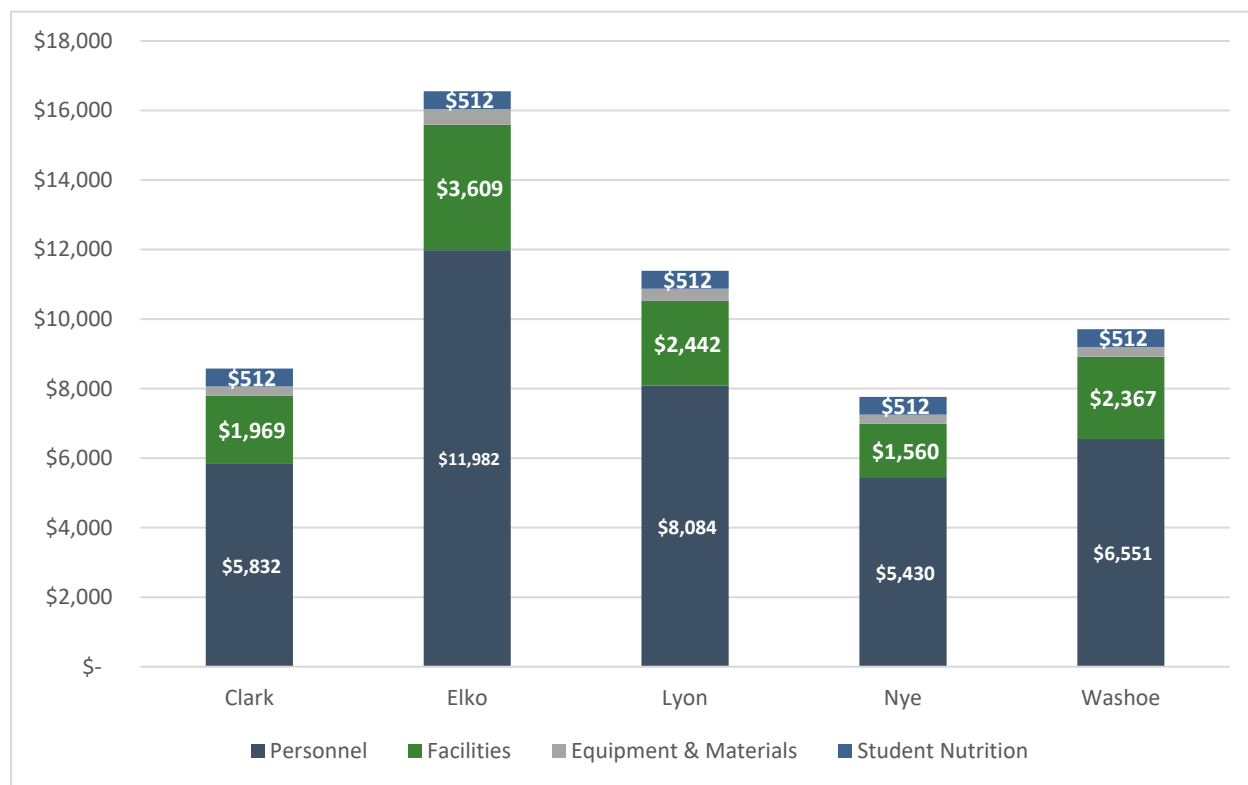
## Results and Findings

### What is the range of cost points above and below the \$8,410 figure?

**Finding 1:** The cost analysis estimates an approximate range of \$7,800–\$16,600 per child in the five case-study counties. The costs for personnel and facilities account for 91 percent of the average per-child estimate.

In all but one county (Nye), the requirements cost more than the current \$8,410 per-child allocation. In the case-study counties, the estimated average per-child amount was \$8,882, totaling \$25.2 million if applied to actual 2021–2022 enrollment. This total was approximately \$3.8 million more than the 2021–2022 allocation. Figure 3 shows the per-pupil amounts by resource category for the five case-study counties.

**Figure 3. Per-Child Estimates by Case-Study Counties and Resource Category**



Source: Study team’s calculations

With 1,287 enrolled children, Clark County drove the average costs; it had the largest share of NR!PK enrollment (53 percent of total enrollment and 64 percent of the 2022 case-study county enrollment). Per-child costs were roughly 85 percent higher in Elko (the highest of the case-study counties), due in part to higher labor and land prices and lower enrollment. Salaries and classroom size drove county cost variations.

Given that the requirements do not vary significantly for LEA and non-LEA sites (in differences that impact costs), these cost estimates did not show that site type is a significant driver of costs.<sup>14</sup> However, using qualitative and observed prices from educators, this study describes how site type might impact costs.

The Finding 2 subsection discusses these cost drivers further. The Salary subsection analysis makes select comparisons to current data, finding that, in most study counties, NR!PK teacher pay is less than the typical price for pre-K staff and K–12 teachers.

<sup>14</sup> The only difference in program elements between LEA and non-LEA are the requirements for teacher professional development. LEA teachers need 15 clock hours per year, whereas non-LEA teachers need 24 hours (NDE, n.d.)

### Average Estimated Costs by Resource Category

Table 5 illustrates the share of estimated costs and average per-pupil costs by resource category. Personnel accounts for the highest percentage of total costs (68 percent), with teachers making up the largest portion of this resource category. Facilities are the next most significant (23 percent), followed by student nutrition (6 percent), and equipment and materials (3 percent).

**Table 5. Share of Estimated Costs and Average Per-Child Estimated Costs by Resource Category**

Category	Percentage of Total	Per Child
Personnel	68%	\$6,043
Facilities	23%	\$2,058
Student Nutrition	6%	\$512
Equipment and Materials	3%	\$268
<b>Total</b>	<b>100%</b>	<b>\$8,882</b>

Source: Study team’s calculations

### Personnel

The NR!PK Required Program Elements outline the site personnel requirements and reflect the key role that NR!PK staff play in child learning and development, child assessment, family engagement and community supports, and data and administrative requirements. The requirements formed the basis for the study team to identify an appropriate salary based on the qualifications and responsibilities of the personnel. The requirements for teachers and teaching assistants also prescribed the minimum work hours, which informed the number of teachers in terms of full-time equivalent positions. For the other roles, the study team made assumptions about time based on the goals of each position as described by the NR!PK Required Program Elements. Table 6 shows the components of the personnel resource category.

**Table 6. Average Estimated Costs by Component of the Personnel Resource Category**

Personnel Ingredient	Percentage of All Costs	Per-Child Estimates	Annual Compensation <sup>15</sup> (full-time, per role)	Quantity per Classroom
Teacher	39%	\$3,495	\$89,285	1
Teacher Professional Development	0.8%	\$68	NA	.01 for LEA teachers .016 for non-LEA teachers
Teaching Assistant	14%	\$1,201	\$49,092	1
Family Engagement Coordinator	12%	\$1,056	\$75,455	.2
Data Specialist	3%	\$224	\$97,261	.04
<b>Total</b>	<b>68%</b>	<b>\$6,043</b>	<b>N/A</b>	<b>N/A</b>

Source: Study team’s calculations

As described in the Methods section, because this study estimated the costs of the requirements and not the current practice, the study team used prices that aligned with the Required Program Elements and not actual NR!PK salaries. Policymakers should consider funding the program at a level that covers the cost of the state requirements. Table 7 outlines the assumptions used to generate personnel estimates. Each calculation is described in detail below.

<sup>15</sup> Compensation includes salary and benefits.

**Table 7. Assumptions Underlying Personnel Cost Estimates by Specific Ingredients**

Personnel Ingredient	Description	Source of Quantity Assumption	Price Source
<b>Teacher</b>	Licensed Teacher with salary comparable to K–12 educator 25-hour work week	NR!PK Required Program Elements	Average Nevada teacher K–12 (NCES)
<b>Teacher Professional Development</b>	15 clock hours for LEA teachers 24 clock hours for non-LEA teachers	NR!PK Required Program Elements	Average of several Nevada Registry–approved options
<b>Teaching Assistant</b>	25-hour work week	NR!PK Required Program Elements	Average Nevada teaching assistant K–12 (BLS)
<b>Family Engagement Coordinator</b>	No minimum requirements  Connects participating children and families to community resources/agencies and to the NR!PK program  Estimated 1 day (.2 FTE) per classroom per week	WestEd estimate based on NR!PK Required Program Elements	Social and community services manager (DNPER)
<b>Data Specialist</b>	No minimum requirements  Supports enrollment and eligibility verification, as well as state reporting requirements  Estimated at .04 FTE	WestEd estimate based on NR!PK Required Program Elements	Education administrator (DNPER)

As in many education programs, personnel is the largest resource component for NR!PK. As policymakers approach program funding, changes to teacher qualifications or hours will have the most significant impact on the NR!PK budget.

### *Facilities*

Neither NR!PK Required Program Elements or the Nevada Pre-K Standards detail facility requirements. As a result, the study team used the Nevada Childcare Licensing Requirements as a proxy to define the number of square feet for indoor, outdoor, and shaded spaces (Nevada Division of Public and Behavioral Health, n.d.). These guidelines define the appropriate size of classrooms based on the number of students.

The study team used a conceptual approach to apply these requirements to the maximum 20-student class size (because space generally does not fluctuate with the number of students) so that all classes are set up for the maximum size. Based on the Nevada Child Care Licensing Requirements, 35 square feet of “useable space” (not including kitchens or hallways) is required per child indoors and 37.5 square feet is required outdoors (ibid). From May through October, the shade requirement is 5 square feet per child (ibid).

The study team used the ECERS III to determine outdoor facilities features, including playgrounds and flooring. The study team chose playgrounds to represent the gross motor activity space. Playground prices reflect an average from national retailers. ECERS III requires protective flooring, and the study team averaged the cost of outdoor foam tiles and playground mulch to fulfill this requirement. The quantity was based on the average playground size and was used to determine the playground price; the price was an average of several national retailers.

Furniture and maintenance and operations are not defined by any available data sources; however, the study team believed these must be included as necessary elements because classrooms do not exist without furniture or maintenance services. This study used national averages adjusted for the Nevada context because there are no Nevada-specific requirements. Furniture was based on national averages of typical pre-K furniture per classroom. Maintenance and operations was a national average based on a survey of school districts. The price was per square foot, which applied to the square footage of the NR!PK classroom and outdoor space (35 square feet per child indoors, and 37.5 outside, as described above).



Table 8 describes the breakdown of the resources included in this category. On average, facilities made up roughly 23 percent of the cost of the requirements in the five case-study counties, equaling approximately \$2,057 per child. Classroom space accounted for the most significant percentage and per-child cost (roughly 13 percent of the facilities total and an average of \$1,166 per child). Appendix A contains detailed explanations of the resources.

**Table 8. Average Estimated Costs by Component of the Facilities Resource Category**

Category	Percentage of Total	Per Child
Classroom	13%	\$1,166
Furniture	0%	\$31
Maintenance and Operations	7%	\$596
Outdoor Space	2%	\$180
Playground	1%	\$46
Playground Flooring	0%	\$38
Shade	0%	\$1.25
<b>Total</b>	<b>23%</b>	<b>\$2,058</b>

Source: Study team’s calculations

Pre-K facilities have a few particular requirements, including the need for smaller furniture, which increase equipment needs compared to K–12 settings and generally make pre-K facilities slightly more expensive (Arthur et al., 2006). Through interviews and focus groups, the study team learned that many sites, whether LEA or center-based, were not using NR!PK grant funds for facilities. In LEA sites, the purchase and upkeep of facilities mainly was financed through the district general fund. In centers, student fees from non-NR!PK classrooms were the primary funding source. However, since facilities are a necessary program resource, this study accounted for them as a key requirement cost.

### *Equipment and Materials*

The NR!PK Required Program Elements do not explicitly list all the equipment required for the program. However, they say sites must participate in the state’s QRIS, which has specifications for equipment and materials that the ECERS III defines. The QRIS is a rating rubric that coaches use to evaluate program quality. It is a detailed scale with descriptions of learning materials and classroom settings corresponding to different ratings. An individual indicator might describe the number and type of items, such as manipulatives or books. A trained reviewer makes an extended site visit, notes the indicators, and develops an overall score by averaging the individual indicators.

Neither the NR!PK Required Program Elements nor Nevada’s QRIS system has a minimum provider score for meeting the program requirements. To include equipment and materials in the cost estimation, the study team had to determine an acceptable minimum NR!PK provider score. The study team based the list of equipment and materials on the ECERS III requirements for an average rating of 5.0 out of the 7.0 scale because NDE considers an average score of 4.5 or above to be high quality, and the ECERS III does not provide descriptions for 4.5, only a score of 3 or 5. The list of ingredients included materials for all applicable subscale items in the ECERS III, including fine motor skills, music and movement, math, nature and science, and dramatic play.

Because the equipment list is lengthy, Appendix A details the ingredients and any adjustments used to estimate the cost. When estimating these costs, the study team reviewed ECERS III and noted all the equipment needs (including general type and quantity) required to meet a score of 5.0 for that indicator. The study team developed an average based on a few national retailers—generally three per item. The total for these materials and books was \$51.

The other ingredient contained in this category is curriculum. As for equipment, the NR!PK Required Program Elements do not have a list of approved curriculum. The elements do, however, provide some direction, stating that NR!PK-funded programs must meet the Nevada Pre-K Standards, which include curriculum direction for literary, math, science, and other domains. The curriculum must also be evidence-based.

The requirement that the curriculum align with Nevada Pre-K Standards is impractical to cost out because it is difficult to determine which specific curriculum align with the Nevada Pre-K Standards content. The study team did not attempt to cost out curriculum alignment with the

Nevada Pre-K Standards, especially since there was no evidence to suggest that the content requirements in the Standards would impact the curriculum price.

Instead, the requirement that the curriculum is evidence-based forms the conceptual basis for the cost estimate. Using the What Works Clearinghouse, a federal resource of evidence-based practices, the team selected three comprehensive pre-K curricula, and summed the cost of one literacy and one math curriculum (to approximate a comprehensive curriculum) and averaged the yearly costs of these curricula to get an average price per classroom. The estimated average cost of curriculum was \$217 per child, or roughly 2.6 percent of the total requirement costs.

Equipment and materials were a relatively small resource category averaging about \$268 per child.

### *Student Nutrition*

The Nevada Pre-K Standards state that “Pre-K programs should offer children breakfast and/or lunch in order to ensure proper nutrition” (Nevada State Board of Education, Nevada State Board of Career and Technical Education, pg. 19, 2010). Food is essential for children's physical health but also plays a role in learning and development. For example, the Nevada Pre-K Standards discuss how food and mealtimes can support children’s development of motor and social skills.

Student nutrition costs are difficult to approximate, as “proper nutrition” is not defined. For ease of calculation and transparency, the study team used the average per-pupil cost of nutrition services for Nevada K–12 students as a proxy (NCES, 2022). This value was multiplied by the number of children at a site. The cost of student nutrition was estimated to be an average of \$512 per child, constituting 6 percent of the total estimated costs.

### **What are the factors that create this range of costs for the requirements?**

---

**Finding 2: Regional variations in salaries and the impact of enrollment on child–teacher ratios are the primary factors impacting cost.**

As described in the Methods section, a particular advantage of this study design is that it applies the same ingredients across all regions, isolating cost factors unrelated to a provider’s choice around which resources to allocate. The cost estimation results show two main factors

that drive the per-pupil cost difference: regional price variations, particularly salaries and labor prices, and enrollment and its impact on student–teacher ratios.

In the cost estimates of the NR!PK requirements, the range of salaries across case-study counties is roughly \$9,000 per teacher. Furthermore, actual NR!PK salary data from ePage and the Nevada Registry show even larger variations in salaries and between LEA and non-LEA providers. This suggests that NR!PK decision-makers should consider how to account for these funding differences for this key resource.

At its first convening, the Advisory Council voiced concerns about salary parity and expressed an interest in learning more about salaries, including averages by program type and region. The Professional Panel also expressed that salary parity is integral to providing high-quality, accessible prekindergarten to all Nevada children. Panel participants suggested that OELD, in partnership with other ECE decision makers, take additional action to ensure the legislative requirement for NR!PK salaries to have parity with K–12 teacher salaries is met.

In consideration of this input, and with the observed variation in NR!PK salaries noted above, the study team conducted additional analysis of NR!PK salaries that is included in the Salaries subsection below.

Enrollment is also a significant factor driving per-pupil cost. Many program expenditures do not necessarily increase or decrease based on the number of students (for example, all classes need a teacher and teaching assistant, whether 10 or 20 children are enrolled). As a result, small classes are much more expensive per student, often far exceeding the \$8,410 amount in the case-study counties.

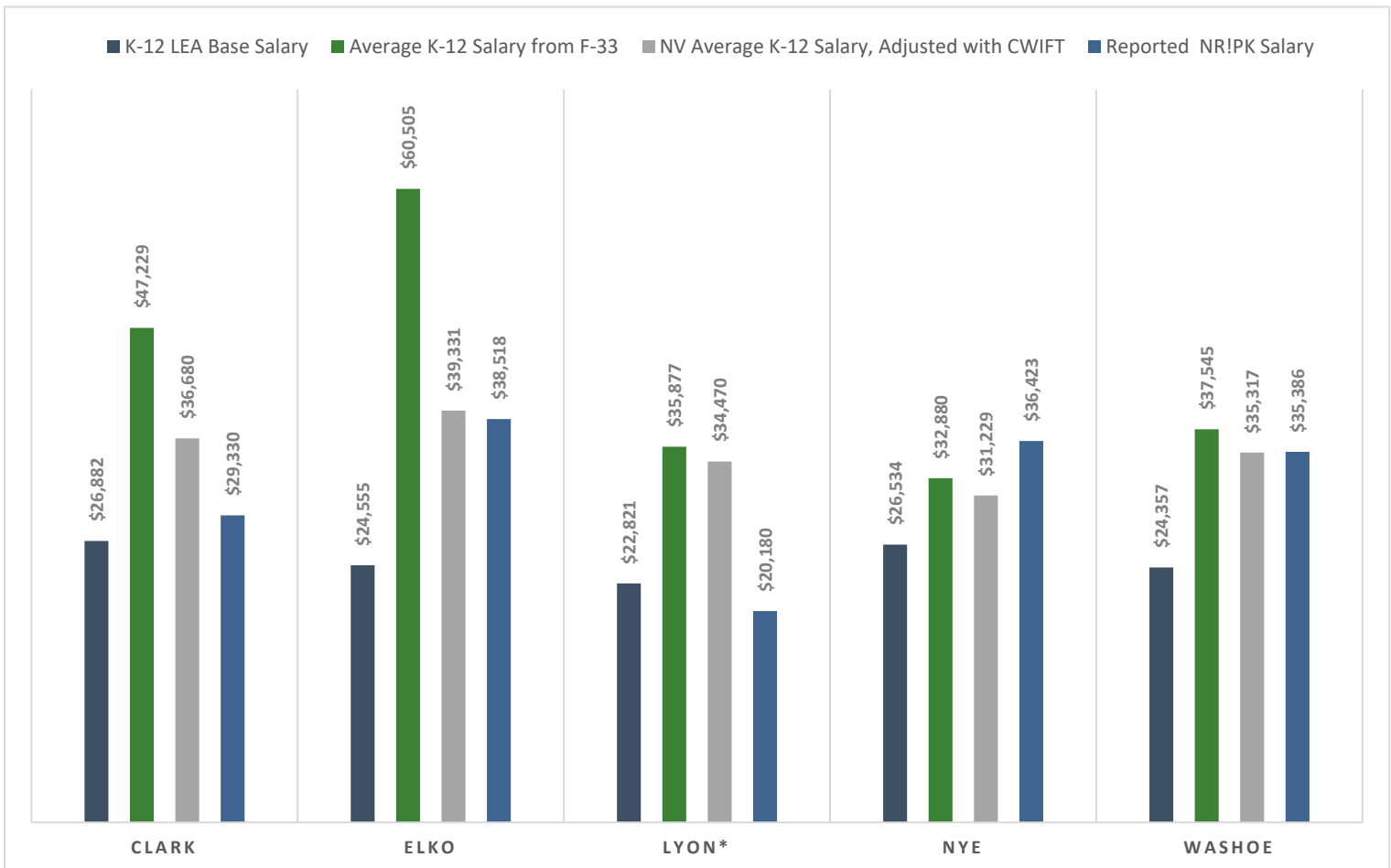
### *Salaries*

Salaries make up a large portion of the NR!PK estimated costs, roughly 68 percent on average. Thus, changes in staff compensation can have meaningful impacts on total cost. The study cost estimates used the NCES average K–12 teacher salary and then adjust for regional variation using the Comparable Wage Index for Teachers (CWIFT). This approach meant that the model cost variations were not due to differences in district hiring preferences but were based on salary demands in that county’s labor market. This detail can help decision makers understand the resources required to align pre-K salaries to K–12 salaries, given differences in local labor prices in the case-study counties. As described in the Personnel section, this cost analysis uses

the K-12 salary because the NR!PK Required Program Elements stipulate that that NR!PK teachers are compensated similarly to K-12 educators.

That said, when considering actual salaries, NR!PK teacher’s salary was less than the average K–12 teacher’s. Within the case-study counties, data reported through ePage for LEA sites and the Nevada Registry for non-LEA sites showed that the average NR!PK teacher salary was \$31,743, roughly \$4,400 less than the average K–12 salary in the 2022 school year. <sup>15</sup> Considering county-level data, average NR!PK salaries were less than the average K–12 teacher in four case-study counties: Clark, Elko, Lyon, and Washoe (see Figure 4). Further, as illustrated, average NR!PK salaries ranged from \$20,180 (estimated) in Lyon to \$38,518 in Elko. <sup>16</sup>

**Figure 4. Average Teacher Salaries by Case-Study County, 2021–2022**



Source: Study team’s calculations

Note: K–12 salaries in the figure are prorated based on the minimum 25-hour workweek for NR!PK teachers.

<sup>16</sup>Due to Nevada Registry data privacy requirements, Lyon’s salary data was suppressed. The study team estimated the salary costs for Lyon by taking the statewide median hourly wage and multiplying it by the number of hours worked (900) and by the CWIFT regional adjustment for Lyon.

This discrepancy between K-12 and NR!PK teacher salaries seems to be largely due to depressed salaries at non-LEA sites. In the case-study counties with LEA sites (Clark, Nye, and Washoe), NR!PK teacher salaries exceeded average K–12 salaries. However, non-LEA teachers had lower salaries when compared to K–12 teachers in all applicable case-study counties. The starkest difference was in Clark County, where non-LEA teachers made an average of \$20 per hour compared to \$43 per hour by LEA teachers. Table 9. shows the average values by county and site type.

**Table 9. Average Salaries by Case-Study Counties**

County	Nevada Average K–12 Salary, Adjusted With CWIFT	Average NR!PK Teacher Salaries—LEA Sites	Average NR!PK Teacher Salaries—non-LEA sites
Clark	\$35,983	\$ 38,573	\$18,000
Elko	\$38,584	NA	\$38,518
Lyon	\$33,815	NA	\$20,180
Nye	\$30,636	\$36,423	NA
Washoe	\$34,646	\$42,095	\$27,000

Source: Study team’s calculations based on data from NCES, ePage, and the Nevada Registry

Note: All salaries have been prorated to a 25-hour work week, based on a 36-week school year to reflect the minimum standard outlined by the NR!PK Required Program Elements.

This comparison highlights that salary ranges are much broader than the adjusted state average and, as a result, may have a more significant impact on the gap between funding and costs than is reflected in the overall cost estimates.

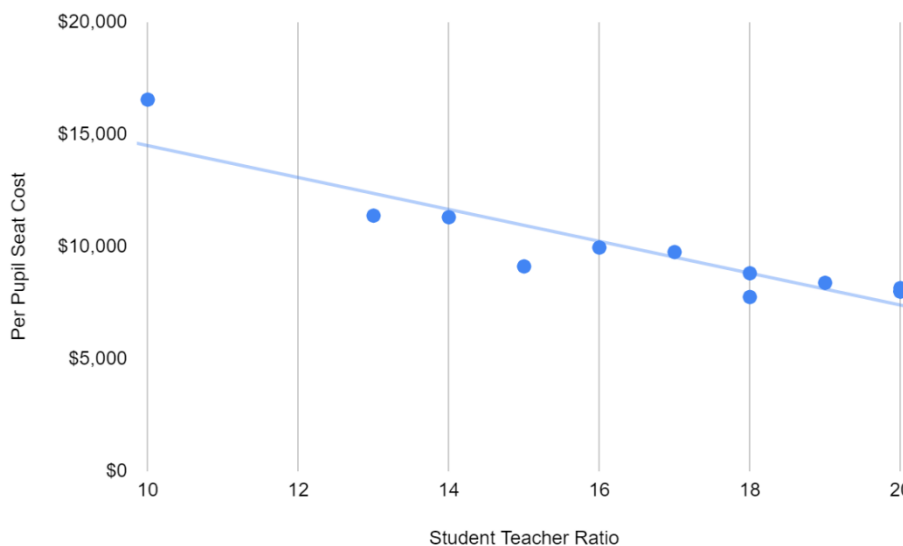
In fact, differences in salary due to county and site type are key to understanding the resources required to implement NR!PK in different settings. Throughout this study’s practioner engagments, providers in various locales and setting types described the ways salaries strained their budgets and caused issues for educator retention. During an interview, a provider from Clark County shared that salaries were their “biggest variable in cost,” and unexpected personnel changes that resulted in salary increases put them in a tough financial spot.

Furthermore, NR!PK salary data showed many providers did not meet the requirement of comparable salaries laid out in the NR!PK Required Program Elements, resulting in lower minimum salaries for NR!PK teachers (NDE, n.d.). Thus, parity between NR!PK and K–12 salaries requires increasing salaries in most case-study counties.

### Enrollment

Enrollment, or class size, is the other factor driving costs. Many Required Program Elements, including teacher, teaching assistant, and facilities do not necessarily increase or decrease with class size. As a result, an additional child often reduces the per-child cost because the same total cost is being divided across more children. Figure 5 demonstrates this dynamic by plotting average class sizes against estimated per-child costs. The trendline shows as class size increases per-child costs decrease.

**Figure 5. Per-Child Seat Cost Compared to Child–Teacher Ratio**



Source: Study team’s calculations

Great Basin College (the only Elko site) best illustrates this trend. Based on the requirements and the 2022 enrollment of 10 children, the estimated cost is approximately \$16,550 per child. This cost is approximately 85 percent more than the average per-child amount in the case-study counties. However, if enrollment is increased to 15 students, the per-child costs decreases to \$11,211; if enrollment increases to 20 children, the per-child price is \$8,538.

The ePage budget data demonstrated the cost squeeze of small class sizes. In 2022, Elko used its entire NR!PK grant amount to cover only the salaries of the teacher and teaching assistant (NDE, 2021). If more children enrolled at that site, the additional per-child allocation from this increased enrollment could cover other necessary resources.

On average, class sizes were higher in Clark and Washoe counties, indicating that urban areas are likely better able to take advantage of these cost efficiencies. Conversely, larger class sizes may not be possible in some rural communities where transportation challenges can discourage or even preclude participation. In the course of the study team’s NR!PK provider engagements, a provider in a rural county told the study team that filling seats was one of the biggest challenges.

### **What is the gap between how much Nevada spends on NR!PK-funded programs and the cost of delivering those programs?**

---

**Finding 3:** In four case-study counties, the \$8,410 allocation does not cover the total cost of the program and provider. On average, the NR!PK funding covers 95 percent of the cost in the case-study counties, and the gap is growing as the allocation does not keep pace with inflation.

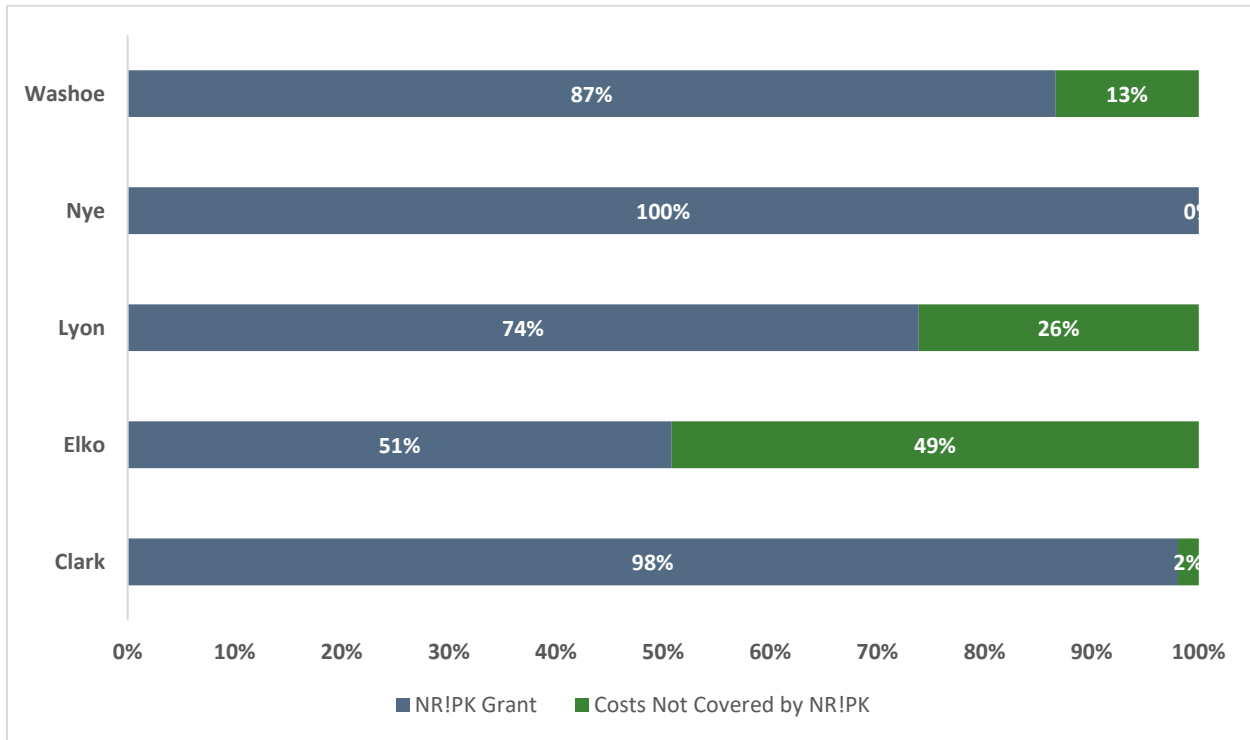
The NR!PK grant amount of \$8,410 covers between 51 percent and 100 percent of the estimated cost of meeting the requirements and standards. The gap between what Nevada spends on NR!PK through the grant and what the NR!PK-funded programs cost is \$0 to \$8,147 (see Figure 6).<sup>17</sup>

---

<sup>17</sup> In one case-study county, the estimated cost of the NR!PK requirements was less than \$8,410, and therefore the gap between what Nevada spends and the cost of the requirements is \$0.



**Figure 6. Percentage of NR!PK Standard Costs Covered by NR!PK Grant in Select Regions, School Year 2022**



Source: Study team’s calculations

This means most providers blend and braid funding from additional sources to cover the NR!PK program costs. Blending and braiding funding was a theme that came up in practitioner engagements. LEA providers used other funds, including IDEA pre-K and general fund dollars, to cover programing costs in rural and urban contexts. Blending and braiding funds ranged from \$0 to over \$5,000 per pupil in the case-study counties.<sup>18</sup>

NDE collects provider-reported data on blending and braiding funds, shown in Table 10. These data show that there is not any single path for financing that all sites follow. The case-study counties all use different funds to cover the cost of NR!PK beyond the grant. Moreover, the per-child amount varies by site. For example, in Nye, the school district spent an additional \$4,580 per enrolled NR!PK child through three grants.

<sup>18</sup> According to provider-reported data, some NR!PK providers reported no blending and braiding with other state and federal funds.

**Table 10. Source of Blended and Braided Funds for NR!PK Sites in Selected Case-Study Counties, 2021–2022**

Subgrantee	Federal Relief Per Child	IDEA Per Child	Title I Pre-K Per Child	Head Start Per Child	Total Non-NR!PK Funds Per Child	Total Including NR!PK Grant	Percent of Funds Non-NR!PK Grant
Clark School District	\$0	\$0	\$147	\$0	\$147	\$8,557	2%
Nye School District	\$305	\$4,017	\$258	\$0	\$4,580	\$12,990	35%
United Way of Southern Nevada	\$0	\$0	\$0	\$5,436	\$5,436	\$13,846	39%
Washoe School District	\$2,388	\$0	\$601	\$0	\$2,989	\$11,399	26%

Source: NDE, 2022; data are self-reported by districts and organizations

Note: Community Services Agency, which operates sites in Washoe, reported Head Start funds but the per-child amounts appeared improbable and therefore were removed from the table.

In addition to blending and braiding, NR!PK classrooms may use resources that are shared between several programs and are thus not purchased through NR!PK grant dollars directly. This sharing of resources is very notable for LEA sites. For example, practitioners in LEA sites told the study team that the LEA often paid for rent and maintenance costs at no direct cost to the program. Additionally, in one district, education leaders mentioned that the district provided laptops and other technology to their NR!PK teachers at no cost to the program.

Non-LEA sites are not often part of a larger organization that allows for this resources sharing, and providers are solely responsible for these costs. In engagements, non-LEA providers indicated they often cover the gap between the NR!PK grant and the cost of the program with other grants (as described above) or with registration and tuition fees from students participating in the program’s tuition-based programs. Facilities (including rent) make up

roughly 23 percent of the average per-pupil estimate, a nontrivial amount which represents a stark difference between LEA and non-LEA sites' cost models.

## Equity Analysis

This section focuses on the beneficiaries of the NR!PK program—families and children—and the extent to which they have equitable access to services. Specifically, this section includes the study team's analysis of equity regarding (1) who is served by NR!PK (and who is not) and (2) how access to NR!PK varies by race and ethnicity or socioeconomic status.

Considering equity alongside the cost analysis is essential, given the cost implications on the NR!PK program's potential longevity and projected long-term return on investment. Benefits of high-quality prekindergarten, such as those noted in the Introduction, are more pronounced for Black or African American and Hispanic or Latino children (Bassok, 2010); however, research suggests that only high-quality early childhood education sustainably yields these impacts (Phillips et al., 2017). This need for quality is particularly notable since families of color tend to have less access to high-quality early childhood education (Gillispie, 2019; Rothwell, 2016; Valentino, 2018; Latham et al., 2020). Moreover, disparate access to high-quality early childhood education is most often seen in state-subsidized early childcare programs (Johnson et al., 2012; Johnson et al., 2020), which tend to be utilized by Black or African American and Hispanic or Latino families in higher proportions than White, Not Hispanic or Latino families.

For states to see the most significant returns on their investments in subsidized early childhood education, policymakers are challenged to find ways to provide high-quality preschool that is both cost-effective and available in the communities with the greatest potential long-term. While high-quality prekindergarten benefits all families, the social impact is more profound and enduring among the communities with the highest levels of need (OECD, 2017).

This equity study examined the extent to which eligible families have equitable access to the NR!PK program, with a key interest in identifying areas where needs remain unmet, particularly among the state's rural and urban populations and historically underserved communities.

## Results and Findings

### Who is served by NR!PK, who is not, and why?

---

**Finding 4:** Demand for NR!PK far exceeds supply, leaving approximately 33,385 eligible children unserved.

An estimated 35,866 Nevada children between the ages of 4 and 5 live in low-income households (see Table 11).<sup>19</sup> This is approximately 48.6% of the total number of children (73,801) in the age group across the state, indicating that almost half of the children in this age group currently qualify for NR!PK. Most of these children reside in Clark County (76 percent, n=27,163) or Washoe County (13 percent, n=4,750), with the majority concentrated in Nevada’s two largest cities, Las Vegas and Reno. More than half (57 percent, n=20,592) are in homes where all parents living in the household are in the labor force. Proportions of working families with NR!PK-eligible children are slightly higher on average in the state’s most populous counties (Clark and Washoe).

NR!PK is currently available to families with incomes below 200 percent of the Federal Poverty Line. Expanding the eligibility threshold to include households with incomes up to 225 percent of the federal poverty level would make an additional 3,687 children eligible for the program. Extending it further to include families with incomes up to 250% would benefit an additional 4,446 children, with numbers increasing similarly as the threshold is expanded. Urban areas would see the greatest numerical and percentage increases in this scenario. For instance, raising the threshold to 225% would benefit an additional 3,486 children across Clark County, Washoe County, and Carson City, compared to 201 children in rural counties. Despite their smaller numbers, however, a higher eligibility threshold could have a substantial relative impact on small communities in rural areas. Additional detail may be found in Table 12 below.

---

<sup>19</sup> “Low-income” is defined as households with a 12-month median income below 200 percent of the Federal Poverty Line for 2020.

**Table 11. Estimated Number and Percentage of Low-Income Children Between 4 and 5 With Working Parents by County**

County	Low-income children between 4 and 5	Low-income children between 4 and 5 with working parents	Percentage of low-income children with working parents
Carson City	684	455	66.5%
Churchill County	294	111	37.8%
Clark County	27,163	15,504	57.1%
Douglas County	435	289	66.4%
Elko County	754	285	37.8%
Esmeralda County	5	2	40%
Eureka County	16	6	37.5%
Humboldt County	211	80	37.9%
Lander County	73	28	38.4%
Lincoln County	50	19	38%
Lyon County	775	515	66.5%
Mineral County	51	19	37.3%
Nye County	416	157	37.7%
Pershing County	60	23	38.3%
Storey County	31	20	64.5%
Washoe County	4,750	3,042	64%
White Pine County	98	37	37.8%
<b>Total</b>	<b>35,866</b>	<b>20,592</b>	<b>57.4%</b>

Source: WestEd calculations based on data from 2016-2020 American Community Survey Public Use Microdata Samples.

**Table 12. Counts of Children Between 4 and 5 by Percent of Household Income Relative to Federal Poverty Level**

County	< 200%	200% to 225%	225% to 250%	250% to 275%	275% to 300%	> 300%	Total
Carson City	684	64	119	17	65	390	1,339
Churchill County	294	12	91	73	15	149	635
Clark County	27,163	2,974	3,140	3,454	2,484	16,019	55,234
Douglas County	435	40	75	11	41	248	851
Elko County	754	32	235	189	38	383	1,631
Esmeralda County	5	0	2	1	0	3	11
Eureka County	16	1	5	4	1	8	35
Humboldt County	211	9	66	53	11	107	457
Lander County	73	3	23	18	4	37	157
Lincoln County	50	2	16	13	3	26	109
Lyon County	775	72	135	20	73	442	1,517
Mineral County	51	2	16	13	3	26	109
Nye County	416	18	130	104	21	211	900
Pershing County	60	3	19	15	3	31	130
Storey County	31	3	5	1	3	18	60
Washoe County	4,750	448	340	412	820	3,645	10,415
White Pine County	98	4	31	24	5	50	212
<b>Total</b>	<b>35,866</b>	<b>3,687</b>	<b>4,446</b>	<b>4,422</b>	<b>3,588</b>	<b>21,792</b>	<b>73,801</b>

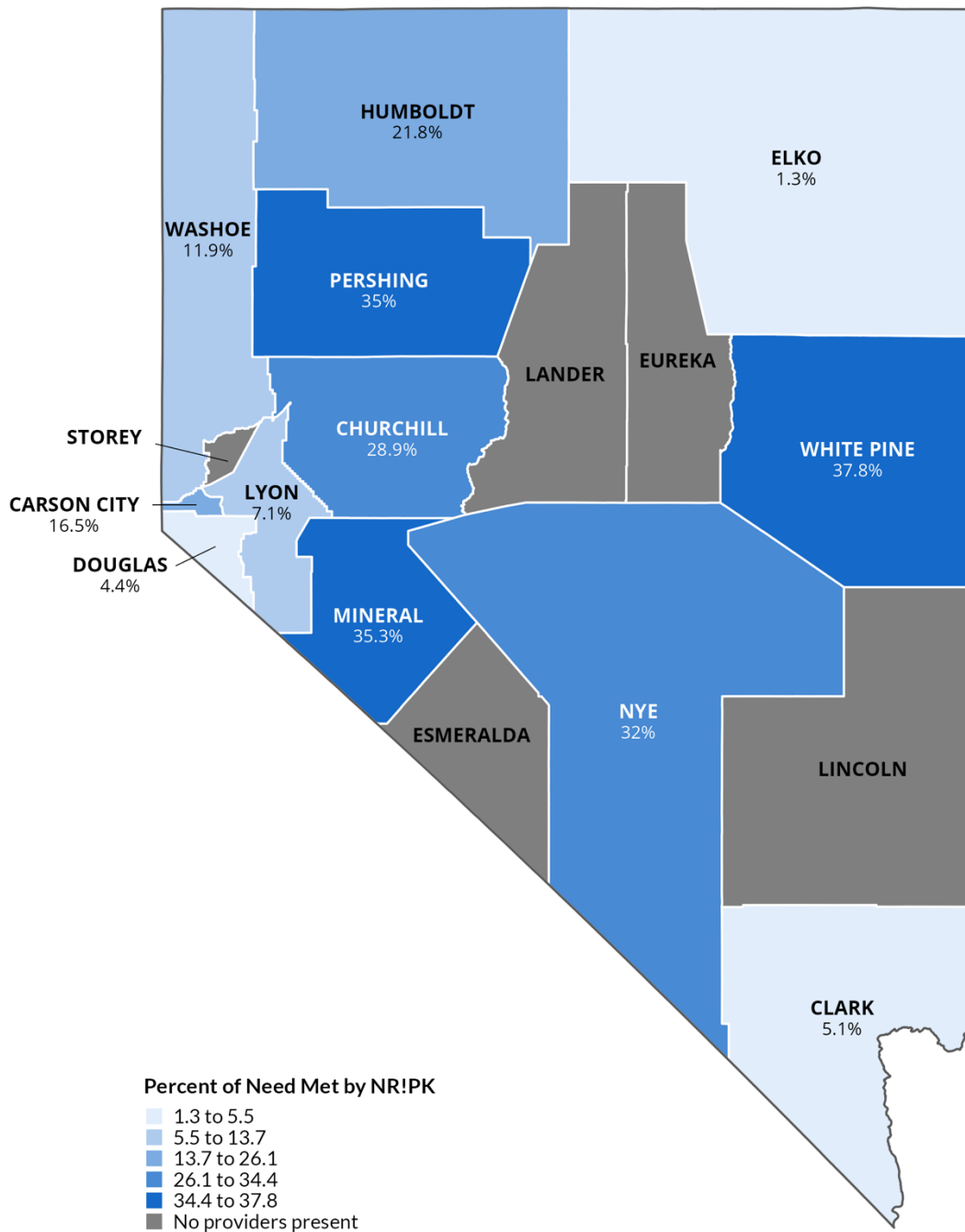
### *Service Levels by County*

At the county level, there is a considerable disparity in NR!PK access and service levels. Clark County exhibits the most pronounced gap, with 25,789 eligible children lacking NR!PK access. Washoe County follows, leaving 3,618 children unserved. Even counties with smaller populations than Clark and Washoe show critical access shortages. Ratios of eligible children to available NR!PK seats are extremely high in rural counties like Elko (73:1), Douglas (22:1), and Lyon (13:1), indicating a severe lack of access despite smaller numbers of eligible families. Also, Esmeralda, Eureka, Lander, Lincoln, and Storey counties have no providers, impacting 171 children.

Another way to express these disparities is by the percentage of need met. This is calculated as the number of seats divided by the number of eligible children. For instance, a county with half

as many seats as children would meet 50 percent of its need. Figure 7 visualizes these percentages geographically, while Table 12 provides a detailed breakdown of service levels by county.

Figure 7. Percentage of Need Met by NR!PK by County





**Table 13. Percentage of Need Met by NR!PK by County**

County	Eligible Children	NR!PK Providers	Total Children Enrolled	Percentage of Need Met	Ratio of Eligible Children to Available Slots
Carson City	684	5	113	16.5%	6:1
Churchill County	294	1	85	28.9%	3:1
Clark County	27,163	42	1,378	5.1%	20:1
Douglas County	435	3	19	4.4%	23:1
Elko County	754	1	10	1.3%	75:1
Esmeralda County	5	0	0	0%	0:1
Eureka County	16	0	0	0%	0:1
Humboldt County	211	1	46	21.8%	5:1
Lander County	73	0	0	0%	0:1
Lincoln County	50	0	0	0%	0:1
Lyon County	775	4	55	7.1%	14:1
Mineral County	51	2	18	35.3%	3:1
Nye County	416	3	133	32%	3:1
Pershing County	60	1	21	35%	3:1
Storey County	31	0	0	0%	0:1
Washoe County	4,750	31	566	11.9%	8:1
White Pine County	98	2	37	37.8%	3:1
<b>Total</b>	<b>35,866</b>	<b>96</b>	<b>2,481</b>	<b>7%</b>	<b>14:1</b>

Finding 5: Location and population demographics are key factors in unmet need. For example, despite having smaller numbers of eligible families than Clark and Washoe counties, many rural counties have stark gaps in availability and NR!PK access in comparison with urban counties.

The U.S. Census indicates that Nevada has 57,409 census blocks, with 44 percent (25,448 blocks) classified as rural. These rural areas encompass over 99 percent of the state’s land but house only 6 percent of the population (183,411 residents). For the purpose of this analysis, counties other than Clark, Washoe, and Carson City are classified as rural.

An estimated 3,269 NR!PK-eligible children reside in rural counties, comprising approximately 9 percent of the total eligible population. Among these, an estimated 1,794 children live in census blocks designated as rural, while the rest live in populated areas, such as towns or small cities.

Rural Nevada has few NR!PK providers, and a significant portion of the eligible population in these areas lack convenient access to services. Of the 96 NR!PK providers across the state, just six are in census blocks designated as rural, serving a combined total of 97 children. On average, about 61 percent of eligible children in rural counties with NR!PK providers lived beyond the 20-minute drive-time access threshold set by the study team (n=1,195, see Table 13). Similarly, nearly 61.5 percent of census blocks with eligible children in these counties were located outside the 20-minute drive-time radius, further illustrating the limited access available to rural families (n=2,895).

**Table 14. NR!PK Accessibility in Rural Counties**

County	NR!PK Eligible Children with Some Access	NR!PK Eligible Children with No Access	Percent of NR!PK Eligible Children with No Access
Churchill County	261	32	11%
Douglas County	261	173	40%
Elko County	389	365	48%
Esmeralda County	0	5	0%
Eureka County	0	16	0%
Humboldt County	178	33	16%
Lander County	0	73	0%
Lincoln County	0	50	0%
Lyon County	0	775	0%
Mineral County	34	16	32%
Nye County	20	396	95%
Pershing County	42	18	30%
Storey County	0	31	0%
White Pine County	87	11	11%
<b>Total</b>	<b>1,274</b>	<b>1,995</b>	<b>61%</b>

On average, families in rural areas had longer commutes and generally traveled farther than urban families. On average, the mean travel time for families in rural counties was about 29 minutes versus about 22 minutes in urban areas. Likewise, families in rural areas traveled about twice as far to access NR!PK sites, with a mean distance across counties of about 20 miles, versus approximately 10.6 miles for urban areas. See Tables 14 and 15 for additional detail on travel time and distance traveled in rural areas.

**Table 15. Travel Time in Minutes to NR!PK Sites by Rural County**

County	Number of Sites	Minimum Travel Time in Minutes	Mean Travel Time in Minutes	Maximum Travel Time in Minutes
Churchill County	1	< 1	11	105
Douglas County	3	< 1	17	59
Elko County	1	1	27	118
Humboldt County	1	2	19	119
Lyon County	4	1	36	120
Mineral County	2	< 1	21	69
Nye County	3	1	41	112
Pershing County	1	1	30	118
White Pine County	2	< 1	12	117

**Table 16. Straight-Line Distance in Miles to NR!PK Sites by Rural County**

County	Number of Sites	Minimum Distance in Miles	Mean Distance in Miles	Maximum Distance in Miles
Churchill County	1	< 1	11	75
Douglas County	3	< 1	9	35
Elko County	1	< 1	42	119
Humboldt County	1	< 1	33	107
Lyon County	4	< 1	24	82
Mineral County	2	< 1	23	75
Nye County	3	< 1	89	227
Pershing County	1	< 1	29	70
White Pine County	2	< 1	26	78

## How does access to NR!PK vary by to race and ethnicity or socioeconomic status?

**Finding 6:** Although levels of need vary overall, the proportion of high-need families is greater among historically underserved communities, including for Black or African American and Hispanic or Latino children.

This section examines the access Nevada’s metropolitan neighborhoods have to NR!PK, including exploration of areas where access may be greater or lesser, with a specific focus on historically underserved populations.

Race and ethnic diversity vary relative to a county’s urbanicity. In Nevada’s rural areas, most of the population identifies as White alone, accounting for 75 percent of the population (n=137,562). Individuals identifying as multiethnic or multiracial comprise the second largest group at 9.3 percent (n=17,022), followed by persons identifying as Hispanic or Latino of any race at 14.5 percent (n=26,535). Other groups, including Black or African American alone, American Indian and Alaska Native alone, Asian alone, Native Hawaiian and Other Pacific Islander alone, and Some Other Race alone, account for less than 5 percent each of the rural population.

In contrast, urban populations are significantly more racially and ethnically diverse. While those identifying as White alone still represent the largest group, they account for a smaller proportion of the total population at 49.7 percent (n=1,450,901). Likewise, Hispanics or Latinos (of any race) constitute a significant proportion of the urban population at 29.6 percent (n=863,722). The percentage the population identifying as Black or African American alone and Asian alone are also notably higher in urban areas than rural areas, at 10.2 percent (n=299,303) and 9.2 percent (n=269,417), respectively. Other groups, including those identifying as Multiethnic/Multiracial, Some Other Race alone, American Indian and Alaska Native alone, and Native Hawaiian and Other Pacific Islander alone, each represent less than 15 percent of the urban population.

Table 16 shows the demographic breakdown of rural and urban populations in Nevada based on U.S. Census block designations.

**Table 17. Estimated Population in Rural and Urban Census Blocks by Race/Ethnicity**

Race / Ethnicity	Rural	Urban
White alone	137,562 (75%)	1,450,901 (49.7%)
Black or African American alone	5,436 (3%)	299,303 (10.2%)
American Indian and Alaska Native alone	7,701 (4.2%)	36,231 (1.2%)
Asian alone	3,286 (1.8%)	269,417 (9.2%)
Native Hawaiian and Other Pacific Islander alone	404 (0.2%)	24,607 (0.8%)
Some Other Race alone	12,000 (6.5%)	423,757 (14.5%)
Two or More Races	17,022 (9.3%)	416,987 (14.3%)
Hispanic or Latino (any race)	26,535 (14.5%)	863,722 (29.6%)

With respect to NR!PK, communities of color comprise much of the eligible population. For example, a little over half identify as non-White (52 percent), 53 percent as Hispanic or Latino, and 18 percent as Black or African American. By contrast, in the population at-large, 42 percent identify as non-White, 27 percent as Hispanic or Latino, and 10 percent as Black or African American.

For all groups other than White (non-Hispanic), shares of NR!PK-eligible children exceed the proportion of the population comprised by each subgroup. Put differently, NR!PK eligibility is disproportionately higher among communities of color. Among these, Black or African American families show the highest proportion of high-need populations among subgroups at about 71 percent (n=4,576).

Similarly, over half of children in limited English speaking households (55.2 percent, n=2,734) live in households where all parents are in the labor force. Table 17 provides data on different population groups and their NR!PK program eligibility and the proportion of those parents in the household that are in the labor force (i.e., “High Need”).

**Table 18. Estimated Number of Low-Income Children by Selected Demographic Categories**

Population	Eligible	Eligible Percentage (n=35,866)	High Need	High Need Percentage (n=20,592)	Percent Eligible Who Are High Need
White	17,743	49.5%	9,452	45.9%	53.3%
White, Hispanic or Latino	9,099	25.4%	5,352	26.0%	58.8%
White, Not Hispanic or Latino	8,644	24.1%	4,100	19.9%	47.4%
Non-White	18,123	50.5%	11,140	54.1%	61.5%
Black or African American*	6,455	18%	4,576	22.2%	70.9%
Hispanic (any race)	18,727	52.2%	10,636	51.7%	56.8%
Limited English Household**	4,952	13.8%	2,734	13.3%	55.2%
Indigenous Populations	860	2.4%	515	2.5%	59.9%

Source: Study team’s calculations based on 2020 5-Year Public Use Microdata Samples

\* Includes multiracial or multiethnic

\*\* Children in households where no person over the age of 14 speaks English “very well,” as defined by the U.S. Census

**Finding 7:** In the Las Vegas metropolitan area, access to high-quality NR!PK providers is clustered in central and northeastern neighborhoods, leaving about 20 percent of low-income children between the ages of 4 and 5 with the most significant access gaps.

The Las Vegas metropolitan area is Nevada’s largest and most densely populated urbanized area. It also has the largest concentration of NR!PK-eligible children, roughly 74 percent overall (n=26,650).

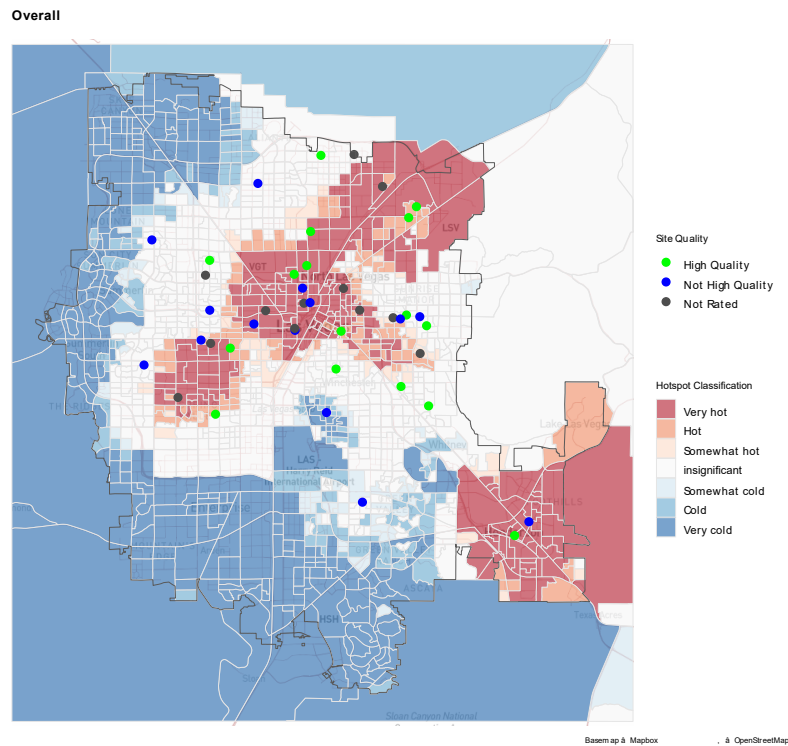
One way to hone in on areas with high or low access to NR!PK is by conducting a hotspot analysis. As noted in the Data and Methods section, hotspots reflect statistically significant clusters of neighborhoods with similar characteristics, such as accessibility scores by block group.

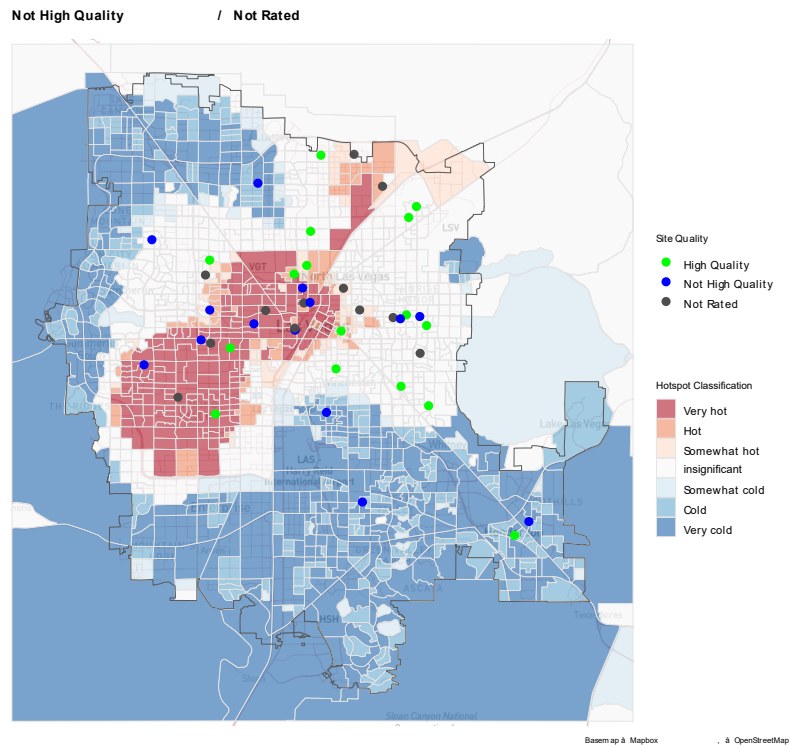
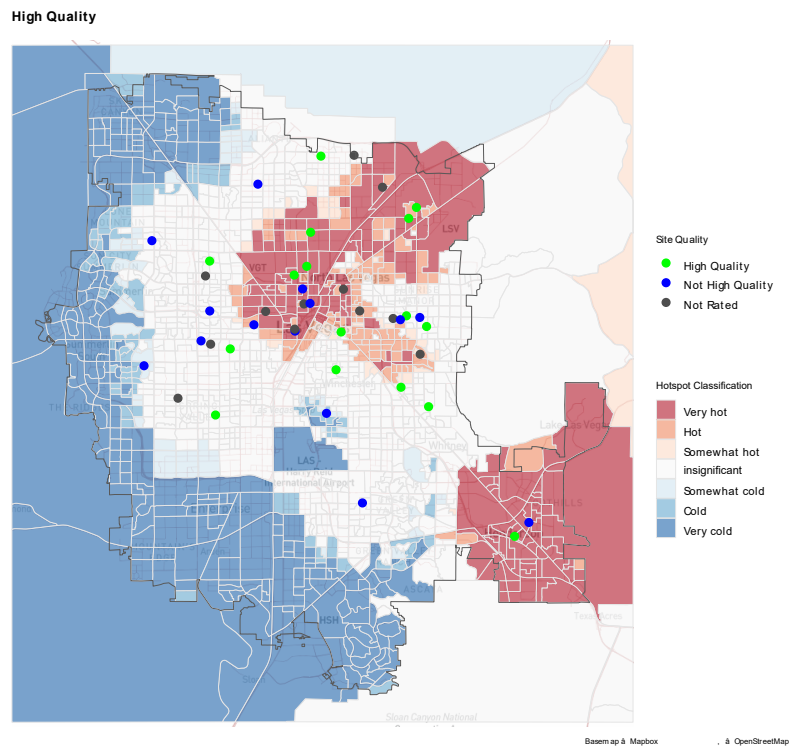
As illustrated in Figure 8, hotspots can be seen along the thoroughfares that diagonally cut across the center of the metropolitan area, with neighborhoods northeast of East Fremont and North Rancho Drive showing greater access to high-quality NR!PK than those on the more affluent southeast side of the city.

The most significant clusters are in the Spring Valley area just north of Enterprise; near the city center at the junction of the Las Vegas Freeway, Interstate 515, and US-95; and in the North Las

Vegas and Nellis Air Force base area along Las Vegas Boulevard North. To the south, Henderson also has high access to NR!PK, despite having only two NR!PK providers serving the area. Conversely, neighborhoods and towns in the north and along the outermost western edge of the urban center have little to no access.

**Figure 8. NR!PK Hotspots by Site Quality in the Las Vegas Metropolitan Area**



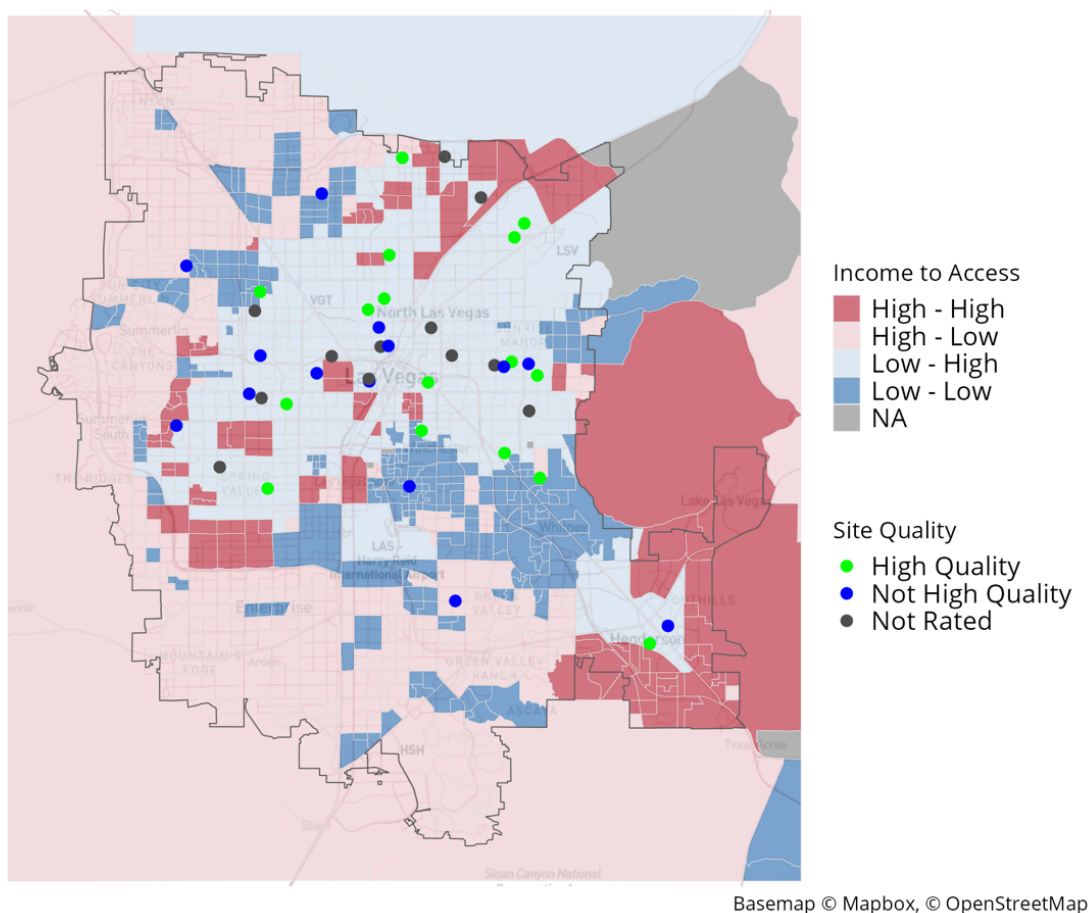


Comparing median income with accessibility scores provides a way to illustrate variations in access to NR!PK along both dimensions. Four distinct groups were created to highlight these variations: areas with high access to NR!PK and high median incomes (High-High), areas with



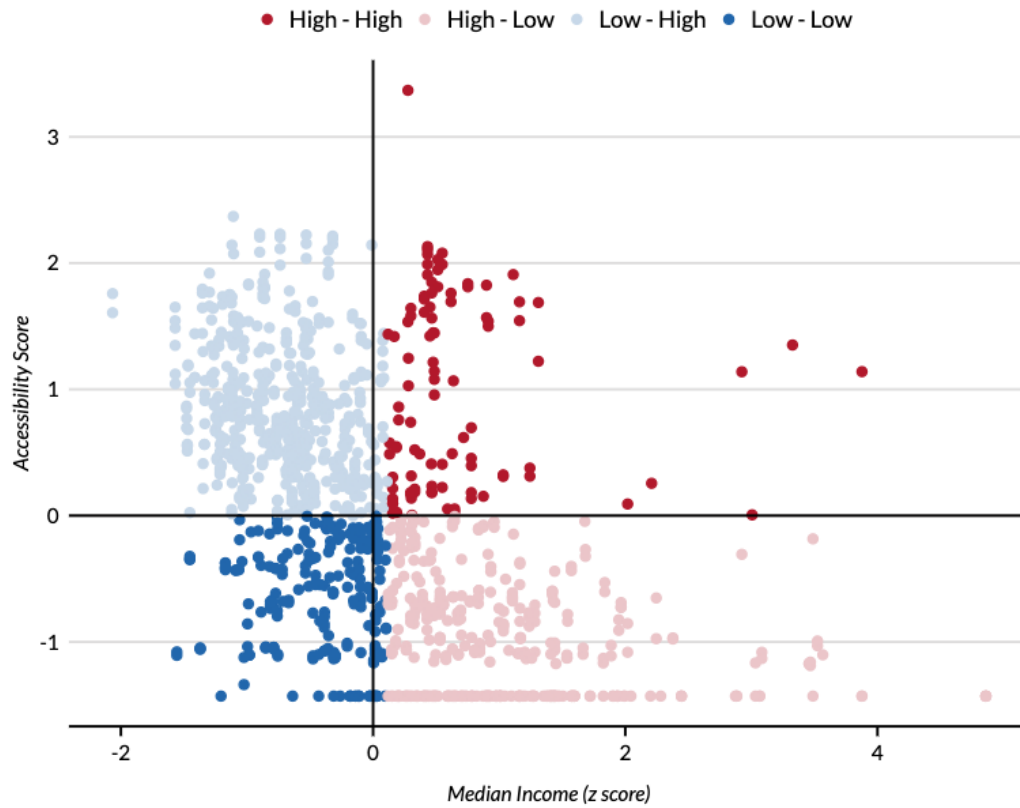
high access and low median incomes (High-Low), areas with low access and high median incomes (Low-High), and areas with low access and low median income (Low-Low). Approximately 42 percent of the Las Vegas metropolitan area block groups have high access to NR!PK and are in census tracts with below-average median incomes, covering about half of the estimated number of NR!PK eligible children in the region (n=12,557). Most of these block groups are located around the city center, and about a quarter align with high-access hotspots (see Figure 9). However, about 7 percent are in low-access low-income areas.

**Figure 9. Income to Access in the Las Vegas Metropolitan Area by Census Tract**



As illustrated in Figure 10, this comparison of access and income is displayed in a scatter plot, with the y-axis representing an accessibility score and the x-axis representing standardized income centered on the median. As seen in the figure, the clustering of access described in the preceding section leaves a sizable group, about 20 percent, of low-income children between the ages of 4 and 5 with significant access gaps. These areas are identified in dark blue in the bottom-right segment of the graphic.

Figure 10. Scatterplot of Income to Access in the Las Vegas Metropolitan Area by Census Tract



Note: 1 dot = 1 census tract

# Recommendations

Based on the cost and equity findings and on the study team’s engagement with practitioners, the team identified recommendations to strengthen and support the NR!PK mixed-delivery system. These recommendations are briefly summarized below and then described in more detail.

**Recommendation 1:** Tie NR!PK funding to inflation to maintain purchasing power

**Recommendation 2:** To improve teacher pay parity, provide funding and improve the monitoring of NR!PK teacher compensation

**Recommendation 3:** Allocate additional funds to support non-LEA NR!PK sites

**Recommendation 4:** Expand access to early information on NR!PK funding allocations when possible

**Recommendation 5:** Address transportation challenges for families

**Recommendation 6:** Cultivate local talent, education, and entrepreneurship

**Recommendation 7:** Incentivize expanded operation and service hours for NR!PK providers

---

## Recommendation 1: Tie NR!PK funding to inflation to maintain purchasing power

This study provided a cost estimate for the 2021–2022 school year, but providers certainly experience the impact of inflation on their purchasing power year-over-year. In other words, as the typical price of any good or service (including labor) increases over time, the same amount of money will buy less of that resource. As a result, if the dollar amount of funding is *unchanged* year-over-year, providers will effectively *lose* funding as inflation pushes up prices across all required program resources. The Professional Panel emphasized the importance of cost of

living increases and accounting for inflation when determining funding allocations. Additionally, the Advisory Council requested that the study team consider how inflation impacts family access.

Accordingly, the Nevada Legislature should consider tying the NR!PK funding allocation to inflation so that the grant amount keeps up with rising prices. NDE OELD can support the Legislature in shaping this policy by providing historical and current data on the rising cost of pre-K personnel and materials and sharing the practitioner experience. NDE OELD should so consider working alongside the Fiscal Analysis Division of the Nevada Legislative Counsel Bureau and the Governor’s Finance Office to model potential scenarios and their impact on the state budget and per-child allocations.

Table 19. shows two possible scenarios for tying the allocation amount to inflation for recent years. Specifically, the 2022–2023 estimates reflect an adjustment of the 2021–2022 seat cost to keep up with inflation, as reflected in two standard measures: the Consumer Price Index (CPI) and the Employment Cost Index (ECI). The increase in dollar amounts is *not* meant to suggest any change in the resources purchased by the program, only a change in their price.

**Table 19. \$8,410 Amount Adjusted by Inflation Measures**

	2021-2022 Per Child	2021-2022 Total	2022-2023 Per Child (Estimated)	2022-2023 Total (Estimated)	2023-2024 Per Child	2023-2024 Total (Estimated)
Adjust Entire Allocation Amount (CPI)	\$8,410	\$21,428,680	\$9,108	\$23,207,260	\$9,318	\$23,742,977
Adjust Average Personnel Proportion (ECI)	\$8,410	NA	\$8,629	\$21,987,057	\$8,747	\$22,287,722

Source: Study team’s calculations based on BLS, 2023; Federal Reserve, 2023

Note: 2022–2023 adjustments are based on inflation from July 2021 through July 2022. 2023–2024 calculations are based on inflation through March 2023.

Nevada already uses a measure of inflation in education funding. The Nevada Pupil Centered Funding Formula uses the CPI-West inflation measure to adjust its base amount (SB 543, 2019). Based on the 2021–2022 initial enrollment numbers, applying the CPI-West increases the total funding amount by roughly \$1.8 million from the 2021–2022 amount. This adjustment equates to a \$698 per-pupil increase.

Alternatively, the allocation amount could be tied only to changes in personnel costs through an index such as the ECI. This amount would then be applied only to the average percentage of costs that is personnel related, roughly 68 percent.<sup>20</sup> Table 19 shows this adjustment for recent years. Based on 2021–2022 initial enrollment numbers, this adjustment increases the total allocation by approximately \$560,000, which equates to a per-pupil increase of \$219.

---

### Recommendation 2: To improve teacher pay parity, provide funding and improve monitoring of NR!PK teacher compensation

The cost study findings highlight that Nevada NR!PK teachers are paid less than the average K–12 teacher, suggesting that this element does not align with program expectations and potentially poses challenges to teacher recruitment and retention (NDE, n.d.; Garver, 2022). The Legislature should consider financial support to improve teacher pay parity, and NDE OELD (along with other relevant NDE offices) should work toward increased data collection and monitoring of NR!PK teacher salaries.

This recommendation also relates to teacher pay parity and would require NDE OELD to clarify the K–12 comparable pay requirement. Currently, the guidance does not detail whether NR!PK teacher salaries should align with the average of the district they are located in, salaries of similarly experienced teachers in that district, or Nevada statewide averages. Additionally, NDE OELD does not have a review or enforcement mechanism for this guidance, which would help to ensure it is widely adopted. In short, further clarification and more regular monitoring of NR!PK teacher salaries is the first step fulfilling the teacher pay parity requirement.

---

<sup>20</sup> This approach would mean that the increase reflects only the increased cost of personnel resources, leaving the facilities and equipment portion untied to inflation. While this approach would have a lower impact on the state budget, it may pose challenges for providers.

As suggested by the Professional Panel, the study team reviewed funding source strategies that other state pre-K programs use to maintain salary parity as several states are encountering this challenge. Table 20 details several common policy approaches.

**Table 20. Common State Policies Supporting Teacher Pay Parity for Pre-K Teachers**

Policy	Description	Examples
<b>Salary Parity: Starting Salary</b>	Align starting pre-k salaries with salaries of starting K–3 or K–12 teachers, using a statewide or LEA salary schedule	Alabama, Georgia
<b>Salary Parity: Salary Schedule</b>	Align pre-K salaries with salaries of K–3 or K–12 teachers, using a statewide or LEA salary schedule with adjustments for teacher qualifications and experience	New Jersey, New York City
<b>One-Time Compensation: Tax Credits</b>	Tax credits for early childhood educators	Colorado
<b>One-Time Compensation: Stipend/Bonus</b>	Additional compensation, usually tied to completion of professional development or other certifications	Arizona, Georgia, Nevada, New Mexico
<b>One-Time Compensation: Scholarships</b>	Support for postsecondary education in related field for early childhood educators	Kentucky, Georgia, Nevada

Source: McLean et al, 2017; National Institute for Early Education Research, 2018

Each of the above policies has advantages and disadvantages, and NDE, in consultation with practitioners, should determine which policy or combination of policies suits its context.

There are several policies designed to increase teacher compensation to achieve partial or full parity with K–12 teachers. In certain states, the starting salaries of pre-K teachers align with the starting salary of a statewide K–12 or K-3 teacher salary schedule (Kilmer, Garver, Barnett, 2022). Without a statewide schedule, the starting pre-K salary could be tied to the starting teacher salary in the district where the site is located. For example, Georgia adopted an incremental approach to salary parity, requiring pre-K teachers to receive the same minimum

salary as K–3 teachers. After phasing in that approach, the state adjusted the salary based on teacher qualifications (McLean et al., 2017).

Alabama requires that lead teachers and teacher assistants are paid following a salary scale. Non-LEA sites follow the Office of School Readiness matrix, and LEA sites are tied to their local salary schedule (Alabama Department of Early Childhood Education, 2022).

Other policies such as tax credits, stipends, and bonuses might supplement teacher salaries but are not long-term solutions and do not achieve parity. For example, a program offering a \$1,000 per-teacher bonus does not address the pay gap between a pre-K teacher and a K–12 teacher; it is simply a flat amount. However, bonus programs may have other goals including incentivizing professional development and encouraging teacher retention (National Institute for Early Education Research, 2018).

In FY 2022 and FY 2023, the Nevada Association for the Education of Young Children (NVAEYC) organized a subsidy program for early childhood educators and pre-K teachers. In early summer 2023, NAEYC is finalizing survey results that will reveal whether this program impacted the teacher experience and retention at NR!PK sites.

---

### Recommendation 3: Allocate additional funds to support non-LEA NR!PK sites

As described in the Findings section, NR!PK center-based providers have a different cost profile; they are directly responsible for facility costs and other central services that LEA sites receive from their district at zero or minimal cost. The Professional Panel raised this issue and suggested that additional support could mitigate it.

NDE and the Legislature should consider offering additional per-pupil or per-site funds to support non-LEA sites. Calculating a precise increase is outside the scope of this research, and NDE OELD should conduct further engagement and research to determine the correct dollar amount. However, decision makers may want to consider support at levels that can address cost pressures from rent (roughly \$1,000 per child) and/or M&O (approximately \$600 per child) because these are generally resources that LEA sites receive in-kind from their district.

Currently, there is a QRIS grant that potentially supports non-LEA sites with additional funding to help them comply with ECERS III requirements. Though it provides additional funds for ECERS III requirements, this grant does not address other direct facility costs for non-LEA providers.

The support is small and designed to cover items such as playground mulch and classroom materials. Moreover, the funding is reduced by half each year on the assumption that additional non-LEA site costs are temporary or for startup needs. However, this study found that these higher costs are persistent.

In New Jersey, LEAs receive the per-pupil funding amounts and are responsible for passing these dollars to LEA sites, private centers, and Head Start programs. In this arrangement, center sites receive \$1,428 per pupil more than LEA sites to make up for the additional costs they face (for a total of \$12,934 per pupil). Additionally, these per-pupil amounts adjust with a county-level regional adjustment to account for regional cost differences. Further, districts must hold a portion of funding to support private sites with early childhood supervisors, nurses, preschool intervention and referral specialists, professional development, and other centralized resources related to student learning and program quality. This funding system leverages centralized cost efficiencies and removes some of the provider cost burden (Garver, Weisenfeld, Connors-Tadros, et al., 2023).

---

#### Recommendation 4: Expand access to early information on NR!PK funding allocations when possible

As described in the Findings section, several Professional Panel and Advisory Council participants mentioned that, every other year, the grant notification process occurs very close to the beginning of the school year.

This challenge is difficult to overcome because of the state budget process and NR!PK's status as a block grant. The timing is subject to some inflexible limitations. The Legislature cannot allocate money beyond the biennium, so the NR!PK budget process cannot extend to every 3 years (or longer), which would give providers an extended budget forecast.

Additionally, there is no clear formula for estimating the allocation because NR!PK is a block grant (as opposed to categorical). Without a clear formula, providers cannot understand what baseline funding might look like from year-to-year. To give providers as much information as possible, NDE OELD may consider working with the Legislative Counsel Bureau Fiscal Analysis Division (or a similar office that provides revenue and expenditure projections) to develop and share several potential funding projections.



Without a simple fix to this challenge, the Legislature and NDE OELD should work together to give NR!PK providers allocation information as early as possible, including information on potential allocation increases or decreases.

---

### Recommendation 5: Address transportation challenges for families

Consistent and reliable transportation is a significant challenge for many families, particularly communities of color and those in rural communities and low-income neighborhoods. These families often have fewer transportation options, live farther away from primary caregivers' places of employment, and, in the case of urban households, are less likely to own a car. The Advisory Council and the Professional Panel expressed that transportation time and cost significantly impact NR!PK access for families in rural and urban communities.

While network analysis was not an explicit focus of this study, it is apparent that transportation challenges exacerbate economic and racial disparities and hinder access to community programs and services. Transportation may be the biggest obstacle to accessing childcare opportunities. Mitigating geographic isolation due to limited transportation access is critical to ensure that a child's zip code is not the sole determining factor for the type and quality of early learning opportunities.

To address transportation barriers, OELD might consider facilitating collaborations between NR!PK, Head Start providers, and other human services agencies to utilize existing transportation networks or share transportation costs. OELD might also explore coordinating with the Nevada Department of Transportation to leverage federally funded transportation programs such as the Rural Area Program or other state transit subsidy programs. Established public transit agencies might also be prompted or incentivized to modify service periods or adjust routes to better align with area pre-K center hours of operation and caregiver work schedules.

More innovative solutions may include utilizing ride-hailing services, such as HopSkipDrive, which has shown some promise in increasing access among K–12 populations with limited transportation options, or replicating or expanding Nevada's Classroom on Wheels bus program, which brings early childcare education to rural areas across Lyon, Storey, and Nye counties.

---

### Recommendation 6: Cultivate local talent, education, and entrepreneurship.

Transportation is one facet of a larger spatial equity challenge related to proximal access to community resources. Transporting children out of their communities is only necessary when the services they need are not readily available, so increasing the availability of local early education services is one way to address transportation constraints. Home-based childcare, particularly in rural areas, can play a crucial role in filling the gaps left by center-based providers' schedules, proximity, service limitations (such as overnight care or extended hours), or other family-side factors that may make uptake less appealing or untenable, such as linguistic differences or lack of diversity among children and center staff. The Advisory Council expressed concern about the impact teacher benefits and incentives have on program cost and teacher retention.

Several barriers hinder the development of local NR!PK talent. NR!PK policy requires teacher academic achievement and credentialing standards that could discourage current providers from participating. Many home-based childcare operators, for example, come from historically underserved communities and face systemic access barriers. These barriers may affect the financial resources and time they have available to pursue the upskilling necessary to qualify as an NR!PK provider, develop professionally, or start or expand a business. Zoning laws and regulations by homeowner's associations can also pose a challenge in that they can prevent the development of childcare centers within a given community altogether.

Cultivating an early childcare workforce may be achieved in several ways. In addition to advocating for financial incentives to increase the quantity of highly trained pre-K teachers and administrators in the talent pool, developing accelerated multilingual education programs with area high schools, adult schools, or community colleges could encourage and hasten progress toward credentials and degrees. Credit for prior learning, early college credit, and experience are vital tools for expediting progress toward academic and professional goals. Internships (and mentorships) are also effective, as are wrap-around services like transportation or subsidized course materials. Partnering with community or state organizations to provide professional development opportunities for center operators or supporting regional communities of practice may also help increase local capacity to administer home-based programs. Likewise, pursuing policies in conjunction with other state agencies, such as tax incentives, grants, or low-interest

loans, to promote and encourage the creation of centers in childcare deserts might also address some practical challenges to increasing NR!PK access.

Developing local capacity for high-quality early childhood education requires a multipronged approach involving multiple stakeholders. Identifying potential partners and key opportunities is a critical first step and one that the findings from this study may bolster.

---

### Recommendation 7: Incentivize expanded operation and service hours for NR!PK providers

Expanding early childhood education centers' operation and service hours is crucial to improving equitable access to pre-K services for families. Many caregivers, particularly those in service industries, who work multiple jobs or have nontraditional work hours, struggle to coordinate around service providers' schedules. This difficulty creates a different hardship for single-parent households, communities of color, and parents and families whose financial circumstances may inhibit access to early childhood education service providers. The Advisory Council members echoed this concern, noting that program operation hours pose a barrier to access and use of NR!PK for families in both rural and urban communities.

Currently, NR!PK requires programs to provide a minimum of 5 hours per day or 25 hours per week. However, the NDE OELD could consider incentivizing expanded hours of operation, especially in areas with high concentrations of eligible children and where the primary industries require their labor force to work long or nonstandard hours, such as where the primary industries are gaming or mining.

## Additional Considerations

### Future Data Collection

Though NDE OELD continues to strengthen its NR!PK data collection process, future targeted improvements should be made. This section describes proposed changes that, if implemented, could strengthen NDE OELD's understanding of the NR!PK cost model and allow for more comprehensive analyses in the future.

Ideally, providers would collect and report all expenditures through the state's uniform chart of accounts allowing for a complete account of all program expenditures by resource category and

funding source. Currently, policymakers, NDE staff, and researchers can only see grant spending and not the NR!PK program spending. A more comprehensive data collection would provide a deeper understanding of actual NR!PK costs.

The benefits notwithstanding, reporting using the multi-dimensional data collection process proposed above could come at a cost. Although the study team has not fully assessed the burden of such a reporting requirement, it is likely significant and may disproportionately impact non-LEA providers.<sup>21</sup> Across the board, the proposed data collection would require considerable training to regularly complete the reporting process.

Without extensive additional data collection, NDE could focus on a few resource categories instead. Soliciting data on teacher salaries, qualifications, tenure, and other teacher characteristics can support teacher pay parity efforts and identify regional and long-term patterns of teacher quality and pay.

Moreover, richer information about capital expenditures could inform policymakers about the NR!PK cost model. In their engagements with the study team, providers mentioned that capital expenditures, including renovations, can be expensive due to the custom nature of pre-K classrooms (e.g., specialized small toilets) and the ECERS III focus on well-kept spaces (e.g., minimal torn blinds). In addition, NR!PK grant money cannot be saved for expensive repairs because providers have to spend the entire NR!PK allocation in the current years. For example, if a provider wants a new playground, money cannot be saved from the current NR!PK allocation to pay for a future expense. Additional capital expenditure data could help NDE understand these investment patterns and begin building a robust and sustainable capital improvement funding system.

As reflected in the Recommendations section, the WestEd team suggests an additional study of the impact of teacher benefits and incentives on program costs and teacher retention. The WestEd team recommends future research to determine the effect of the COVID-19 pandemic on the cost of goods, services, and personnel.

---

<sup>21</sup> LEA providers would likely have support from their district's finance office to complete this reporting (which is in line with other K–12 programs). Though districts generally have the knowledge and software tools to accomplish this reporting, some districts may have to increase the time their staff spends on NR!PK to meet this requirement. Non-LEA sites may have a different situation, as they may lack the institutional knowledge and software to complete this reporting. It is possible that subgrantees such as the United Way and the Children's Cabinet could offer support in this area.

# Conclusion

This report presents the cost and equity findings of Nevada’s state-funded prekindergarten program, NR!PK, in five case-study counties. For the cost study component, comprehensive quantitative and qualitative data analyses determined the range of cost points to meet the required program elements and the factors that create regional ranges. For the equity component, the study team used an enhanced two-stage floating catchment area method and hotspot analysis to examine which children were served by NR!PK and which were not, based on race and ethnicity, socioeconomic status, and location. Finally, the study team engaged Nevada early education experts to provide feedback on the initial study findings and offer suggestions for policy and funding adjustments that would increase NR!PK access for historically underserved communities.

As the report describes, the cost analysis suggests that the current \$8,410 per-child allocation does not cover all program element costs in 4 out of 5 of the case-study counties. This study estimates a \$7,800–\$16,600 per-child cost in the five case-study counties, with the costs for personnel and facilities comprising 91 percent of the average per-child estimate. All five case-study counties reported needing to blend and braid additional sources of funding in order to fully implement the NR!PK program. Needing to rely on additional sources of funding creates sustainability challenges for providers. Moreover, on average the current state funding only covers 95 percent of the total program cost in the case-study counties and since the allocation does not keep pace with inflation, the \$8,410 per-child allocation will cover a lesser percentage of the total cost of the program each year.

In addition to the gap between current funding and the cost to meet the NR!PK program elements, a gap also exists between the number of eligible children and the capacity of current NR!PK providers. More specifically, there are over 30,000 unserved eligible children (with location and population demographics being key factors); rural counties have more significant availability gaps than urban counties; and the proportion of high-need families is greater among

historically underserved communities, including Black or African American and Hispanic or Latino children.

Understanding the cost factors contributing to meeting the program elements, how those costs vary by location, and how to better provide services in rural and historically underserved communities is imperative to meeting current and future access and funding demands of the NR!PK program.

# References

- Agron, J. (2007). 36th Annual Maintenance & Operations Cost Study for Schools. American School and University. <https://www.asumag.com/research/article/20851274/36th-annual-maintenance-operations-cost-study-for-schools>
- Alabama Department of Early Childhood Education. (2022). First class pre-k program guidelines. <https://children.alabama.gov/wp-content/uploads/2022/05/2022-2023-Program-Guidelines.pdf>
- American Floormats. (2022a). Rubber Playground Tiles. American Floormats. [https://www.americanfloormats.com/rubber-playground-tiles/?gclid=Cj0KCQjwnbmaBhD-ARIsAGTPcfVdMcxB8VS3NHxSqKcDP42u3m0WkCF0oB1fM8GWQovIR-QQRHwres8aAvtDEALw\\_wcB#pricing](https://www.americanfloormats.com/rubber-playground-tiles/?gclid=Cj0KCQjwnbmaBhD-ARIsAGTPcfVdMcxB8VS3NHxSqKcDP42u3m0WkCF0oB1fM8GWQovIR-QQRHwres8aAvtDEALw_wcB#pricing)
- American Floormats. (2022b). Solid Play Rubber Playground Flooring. Retrieved December 14, 2023 from [https://www.americanfloormats.com/SolidPlay-Rubber-Playground-Flooring-Tiles/?gclid=Cj0KCQjwnbmaBhD-ARIsAGTPcfWG3x7X8KfNWBpqK0TbMqquNiAPIjYM3hgbmbDA0H9R7wY\\_1y7SThYaAjaTEALw\\_wcB](https://www.americanfloormats.com/SolidPlay-Rubber-Playground-Flooring-Tiles/?gclid=Cj0KCQjwnbmaBhD-ARIsAGTPcfWG3x7X8KfNWBpqK0TbMqquNiAPIjYM3hgbmbDA0H9R7wY_1y7SThYaAjaTEALw_wcB)
- American Institutes for Research. (2021). *Standard for the economic evaluation of educational and social programs*. <https://www.air.org/sites/default/files/Standards-for-the-Economic-Evaluation-of-Educational-and-Social-Programs-CASP-May-2021.pdf>
- Arthur, D. W., Larson, C., Gillman, A., & Sussman, C. (2006). Community investment collaborative for kids resource guide: Equipping and furnishing early childhood facilities. Local Initiatives Support Cooperation/Community Investment Collaborative for Kids. [https://www.lisc.org/media/filer\\_public/de/b0/deb03f6a-804e-4a0a-8a70-44a99f55c6a3/2005\\_cick\\_guide\\_vol3\\_equipping.pdf](https://www.lisc.org/media/filer_public/de/b0/deb03f6a-804e-4a0a-8a70-44a99f55c6a3/2005_cick_guide_vol3_equipping.pdf)

- Bassok, D. (2010). Do Black and Hispanic children benefit more from preschool? Understanding differences in preschool effects across racial groups. *Child Development*, 81(6), 1845–1848.
- Chang, Y., & Head, L. (2022). Database of national prices of educational resources. CAP Project. [https://capproject.org/s/Database-of-Prices\\_04272022-llz5.xlsx](https://capproject.org/s/Database-of-Prices_04272022-llz5.xlsx)
- Cornman, S. Q., Doyle, S., Howell, M. R., and Phillips, J. (2022). NCES Common Core of Data National Public Education Financial Survey (NPEFS), School Year 2019–20 (Fiscal Year 2020), Provisional File Version 1a (NCES 2022-302). National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education. <https://nces.ed.gov/pubsearch>
- Cornman, S. Q., Nixon, L. C., Spence, M. J., Taylor, L. L., & Gevert, D. E. (2019). Education demographic and geographic estimates (EDGE) Program: American community survey comparable wage index for teachers (ACS-CWIFT) (NCES 2018–130). U.S. Department of Education. Washington, DC: National Center for Education Statistics. <http://nces.ed.gov/pubsearch/>
- Covers & All. (2023). Custom Sun Shade Sail- Rectangle. Covers & All. Retrieved May 30, 2023 from [https://www.coversandall.com/solar-shades/sun-shade-sail/classic-sun-shade-sail/custom-sun-shade-sail-rectangle-p?gclid=CjwKCAjwpuajBhBpEiwA\\_ZtfhXZG05MPQG16\\_6t85D\\_J49llagSEapAg-iPhX9KEEvDpLI\\_7LYeaRhoC6fgQAvD\\_BwE](https://www.coversandall.com/solar-shades/sun-shade-sail/classic-sun-shade-sail/custom-sun-shade-sail-rectangle-p?gclid=CjwKCAjwpuajBhBpEiwA_ZtfhXZG05MPQG16_6t85D_J49llagSEapAg-iPhX9KEEvDpLI_7LYeaRhoC6fgQAvD_BwE)
- Davis, E., Lee, W. F., & Sojourner, A. (2019). Family-centered measures of access to early childhood care and education. *Early Childhood Research Quarterly*, 47, 472–486.
- García, J. L., Heckman, J. J., Leaf, D. E., & Prados, M. J. (2016). The life-cycle benefits of an influential early childhood program (Working Paper 22993). Cambridge, MA: National Bureau of Economic Research.
- Garver, K. (2020). State pre-k policies: Salary parity varies with teacher qualifications and setting. National Institute for Early Education Research. <https://nieer.org/wpcontent/uploads/2020/01/Pre-K-Teacher-YBK-brief-1-29-20.pdf>
- Garver, K., Weisenfeld, G. G., Connors-Tadros, L., Hodges, K., Melnick, H., & Plasencia, S. (2023). State preschool in a mixed delivery system: Lessons from five states. Learning Policy Institute. <https://doi.org/10.54300/387.446>



- Gillispie, C. (2019). Young learners, missed opportunities. The Education Trust.  
<https://edtrust.org/resource/young-learners-missed-opportunities/>
- Golin, S. C., Muenchow, S., Wang, H., & Lam, I. (2007). Estimating the cost of preschool for all in California: A policy brief. American Institutes for Research.  
[https://www.air.org/sites/default/files/202106/Estimating%20the%20Cost%20of%20Preschool%20for%20All%20in%20California\\_0.pdf](https://www.air.org/sites/default/files/202106/Estimating%20the%20Cost%20of%20Preschool%20for%20All%20in%20California_0.pdf)
- Gray-Lobe, G., Pathak, P. A., & Walters, C. R. (2022). The long-term effects of universal preschool in Boston. *The Quarterly Journal of Economics*, 138(1), 363–411.
- Guagliardo, M. F. (2004). Spatial accessibility of primary care: Concept, methods and challenges. *International Journal of Health Geographics*, 3, 3–13.
- Harms, T., Clifford, R. M., & Crye, D. (2015). *Early childhood environment rating scale* (3rd ed). Teachers College Press.
- Home Depot (2023a). Coolaroo Coolhaven. Retrieved May 30, 2023 from  
<https://www.homedepot.com/p/Coolaroo-Coolhaven-12-ft-x-12-ft-Sahara-SquareShade-Sail-with-Kit-473945/205415813>
- Home Depot. (2023b). 5 cubic yard Bulk Playground Mulch. Retrieved June 3, 2023 from  
<https://www.homedepot.com/p/5-cu-yd-Bulk-Playground-Mulch-BKKKWF5/205406879>
- Johnson, A. D., Martin, A., & Schochet, O. N. (2020). Inside the classroom door: Understanding early care and education workforce and classroom characteristics experienced by children in subsidized center-based care. *Early Childhood Research Quarterly*, 51, 462–472.
- Johnson, A. D., Ryan, R. M., & Brooks-Gunn, J. (2012). Child-care subsidies: Do they impact the quality of care children experience? *Child Development*, 83(4), 1444–1461.
- Kawabata, M. (2015). Childcare access and employment: The case of women with preschool-aged children in Tokyo. *Review of Urban & Regional Development Studies*, 26(1), 40–56.
- Kilander, A., Garver, K., & Barnett, W. S. (2022). Unworthy wages: State-funded preschool teacher salaries and benefits. National Institute for Early Education Research.  
[https://nieer.org/wp-content/uploads/2022/05/Unworthy\\_Wages\\_State-Funded\\_Preschool\\_Teacher\\_Salaries\\_and\\_Benefits\\_052722.pdf](https://nieer.org/wp-content/uploads/2022/05/Unworthy_Wages_State-Funded_Preschool_Teacher_Salaries_and_Benefits_052722.pdf)
- LandScan. (2021) High resolution global population data set. UT-Battelle, LLC, operator of Oak Ridge National Laboratory under Contract No. DE-AC05-00OR22725 with the United States Department of Energy.

- Latham, S., Corcoran, S. P., Sattin-Bajaj, C., & Jennings, J. L. (2020). Racial disparities in pre-k quality: Evidence from New York City’s universal pre-k program. *Educational Researcher*, 50(9), 607–617.
- Li, M. T., Yang, L. B., & Wei, Y. (2016). Improved Gaussian based 2-step floating catchment area method: A case study of green space accessibility in Shanghai. *Progress in Geography*, 35(8), 990–996.
- Luo, W., Qi, Y. (2009). An enhanced two-step floating catchment area (E2SFCA) method for measuring spatial accessibility to primary care physicians. *Health and Place*, 15, 1100–1107.
- Lin, V., & Madill, R. (2019). Incorporating spatial analyses into early care and education research. OPRE research brief #2019-88. Washington, DC: Office of Planning, Research, and Evaluation, Administration for Children and Families, U.S. Department of Health and Human Services.
- Luo, W. (2004). Using a GIS-based floating catchment method to assess areas with shortage of physicians. *Health and Place*, 10, 1–11.
- Luo, W., & Wang, F. (2003a). Spatial accessibility to primary care and physician shortage area designation: a case study in Illinois with GIS approaches. In: Skinner, R., Khan, O. (Eds.), *Geographic information systems and health applications*, pp. 260–278. Idea Group Publishing, Hershey, PA.
- Luo, W., & Wang, F. (2003b). Measures of spatial accessibility to health care in a GIS environment: synthesis and a case study in the Chicago region. *Environment and Planning B: Planning and Design*, 30, 865–884.
- Meloy, B., Gardner, M., & Darling-Hammond, L. (2019). Untangling the evidence on preschool effectiveness: Insights for policymakers. Learning Policy Institute.
- McLean, C., Dichter, H., & Whitebook, M. (2017). Strategies in pursuit of pre-k teacher compensation parity: Lessons from seven states and cities. Center for the Study of Child Care Employment, University of California, Berkeley and National Institute for Early Education Research. [https://nieer.org/wp-content/uploads/2017/10/Pre-K-parity-case-studies-report\\_FINAL-1.pdf](https://nieer.org/wp-content/uploads/2017/10/Pre-K-parity-case-studies-report_FINAL-1.pdf)
- National Center for Education Statistics. (2022). Table 211.60 Estimated average annual salary of teachers in public elementary and secondary schools, by state: Selected school years, 1969-70 through 2021-22. [https://nces.ed.gov/programs/digest/d22/tables/dt22\\_211.60.asp](https://nces.ed.gov/programs/digest/d22/tables/dt22_211.60.asp)

National Institute for Early Education Research. (2018). Special report: Supporting teachers in state-funded preschool.

[https://nieer.org/wpcontent/uploads/2019/04/YB2018\\_Workforce\\_Special-Report.pdf](https://nieer.org/wpcontent/uploads/2019/04/YB2018_Workforce_Special-Report.pdf)

National Survey of Early Care and Education Project Team (2022). 2019 National Survey of Early Care and Education Data Collection and Sampling Methodology Report. OPRE Report 2022-118, Washington DC: Office of Planning, Research, and Evaluation, Administration for Children and Families, U.S. Department of Health and Human Services.

Nevada Department of Education. (n.d.) Nevada ready! State Pre-K. Nevada Department of Education. [https://doe.nv.gov/Early\\_Learning\\_Development/Nevada\\_Ready\\_State\\_Pre-K/](https://doe.nv.gov/Early_Learning_Development/Nevada_Ready_State_Pre-K/)

Nevada Department of Education. (2021). ePAGE - electronic plans, applications, grants and expenditures home.

<https://nevada.egrantsmanagement.com/Default.aspx?ccipSessionKey=638203554826258048>

Nevada Division of Public and Behavioral Health. (n.d.). Childcare FAQs. Nevada Division of Public and Behavioral Health.

<https://dpbh.nv.gov/uploadedFiles/dpbh.nv.gov/content/Reg/childCare/Folders/FAQs/Childcare%20FAQ.pdf>

Nevada Office of Early Learning and Development. (2021). [FY22 Dec 1 NR!PK Student Counts] [Unpublished raw data provided by email].

Nevada State Board of Education. (2021). Nevada Ready! State Pre-K Program: November 1 Report for FY20 and FY21.

[https://www.leg.state.nv.us/Division/Research/Documents/RTTL\\_NRS387.658\\_2021.pdf](https://www.leg.state.nv.us/Division/Research/Documents/RTTL_NRS387.658_2021.pdf)

Nevada State Board of Education, Nevada State Board for Career and Technical Education. (2010). Nevada pre-kindergarten standards.

[https://doe.nv.gov/uploadedFiles/nde.doe.nv.gov/content/Early\\_Learning\\_Development/State\\_PreK/PreKStandards.pdf](https://doe.nv.gov/uploadedFiles/nde.doe.nv.gov/content/Early_Learning_Development/State_PreK/PreKStandards.pdf)

OECD (2017). Starting Strong 2017: Key OECD Indicators on Early Childhood Education and Care, OECD Publishing, Paris.

- Phillips, D., Lipsey, M. W., Dodge, K. A., Haskins, R., Bassok, D., Burchinal, M. R., & Weiland, C. (2017). Puzzling it out: The current state of scientific knowledge on pre-kindergarten effects. A consensus statement.
- Playground Boss. (2022). 2 to 5. Playground Boss. Retrieved December 14, 2023 from <https://www.playgroundboss.com/products/playgrounds/ages2-5/>
- Practice Sports. (2023). Wood Carpet Engineers Wood Fibers for Playgrounds. Practice Sports. Retrieved June 3, 2023 from [https://practicesports.com/product/woodcarpet-engineered-wood-fiber-for-playgrounds/?gclid=CjwKCAjwpuajBhBpEiwA\\_ZtfhdBcUdTYFXjOQAKP5\\_Z086x8TW1uCn6xZolca534rJlpJ10Ym7xChRoC7CAQAvD\\_BwE](https://practicesports.com/product/woodcarpet-engineered-wood-fiber-for-playgrounds/?gclid=CjwKCAjwpuajBhBpEiwA_ZtfhdBcUdTYFXjOQAKP5_Z086x8TW1uCn6xZolca534rJlpJ10Ym7xChRoC7CAQAvD_BwE)
- Radke, J., & Mu, L. (2000). Spatial decomposition, modeling and mapping service regions to predict access to social programs. *Geographic Information Sciences*, 6, 105–112.
- Rothwell, J. T. (2016). Classroom inequality and the cognitive race gap: Evidence from 4-year olds in public preK. [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2740527](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2740527)
- Rubber Flooring Inc. (2022). Jamboree Playground Tile. Retrieved December 14, 2023 from <https://www.rubberflooringinc.com/interlocking-tile/jamboree-playground-tile.html?i=9693>
- RubberMulch.com. (2023). Brown PlaySafer Rubber Mulch. RubberMulch.com Retrieved June 3, 2023 from [https://rubbermulch.com/products/brown-playsafer-rubber-mulch-75-cubic-ft-pallet-2-000-lbs?variant=36594831589539&campaignid=17997534872&adgroupid=&term=&matchtype=&gclid=CjwKCAjwpuajBhBpEiwA\\_ZtfhetjawnRpi0ZHLJzN2B9cVyk1IRuOXaJ2qMFIBcU3X47oLO\\_q-ZSCBoCj8wQAvD\\_BwE](https://rubbermulch.com/products/brown-playsafer-rubber-mulch-75-cubic-ft-pallet-2-000-lbs?variant=36594831589539&campaignid=17997534872&adgroupid=&term=&matchtype=&gclid=CjwKCAjwpuajBhBpEiwA_ZtfhetjawnRpi0ZHLJzN2B9cVyk1IRuOXaJ2qMFIBcU3X47oLO_q-ZSCBoCj8wQAvD_BwE)
- Schweinhart, L. J., Montie, J., Xiang, Z., Barnett, W. S., Belfield, C. R., Nores, M. (2005). Lifetime effects: The High/Scope Perry Preschool Study through age 4. Monographs of the High/Scope Educational Research Foundation No. 14. Ypsilanti, MI: High/Scope Press.
- Solis, J. (2021). Nevada falls short in early childhood education, report finds. Nevada Current. <https://www.nevadacurrent.com/2021/04/26/nevada-falls-short-in-early-childhood-education-report-finds/>
- State of Nevada. (2019). Senate Bill 543, 2019 Biennium Regular Session. <https://www.leg.state.nv.us/App/NELIS/REL/80th2019/Bill/7052/Overview>
- State of Nevada. (2022). SR068-22A. § 1, NRS 387.656. <https://www.leg.state.nv.us/Register/2022Register/R068-22A.pdf>

- The Nevada Registry. (n.d.). Training calendar. <https://ww2.nevadaregistry.org/Calendar/>
- The Nevada Registry. (2022). [Median wage of NV!PK Staff: Clark, Elko, Lyon, Nye and Washoe Counties] [Suppressed aggregated data provided by email].
- U. S. Bureau of Labor Statistics. (2022). May 2022 state occupational employment and wage estimates. [https://www.bls.gov/oes/current/oes\\_nv.htm#25-0000](https://www.bls.gov/oes/current/oes_nv.htm#25-0000)
- U.S. Census Bureau. (2020). 2016-2020 American Community Survey 5-Year Estimates. [https://data.census.gov/table?q=S2001&g=040XX00US32,32\\$0500000&tid=ACSST5Y2021.S2001](https://data.census.gov/table?q=S2001&g=040XX00US32,32$0500000&tid=ACSST5Y2021.S2001)
- U.S. Department of Housing and Urban Development, Office of Policy Development and Research. (2022). Fair market rents. <https://www.huduser.gov/portal/datasets/fmr.html>
- Valentino, R. (2018). Will public pre-K really close achievement gaps? Gaps in prekindergarten quality between students and across states. *American Educational Research Journal*, 55(1), 79–116.
- Wang, Y., Hollands, F. M., Shand, R., Pratt-Williams, J. Head, L., Kushner, A., & Chang, Y. (2020). Cost of facilities calculator. Cost Analysis in Practice (CAP) Project. [https://capproject.org/s/Cost-of-Facilities-Calculator\\_CAP-Project\\_Final.xlsx](https://capproject.org/s/Cost-of-Facilities-Calculator_CAP-Project_Final.xlsx)
- Wayfair. (2023). Royal Shade Triangle Shade Sail. Wayfair. Retrieved May 30, 2023 from [https://www.wayfair.com/Royal-Shade--20-Triangle-Shade-Sail-rsTAPT20-L6989-K~FYAL1019.html?refid=GX657561173969-FYAL1019\\_55597056&device=c&ptid=1212241869960&network=g&targetid=pla-1212241869960&channel=GooglePLA&ireid=137483493&fdid=1817&PiID%5B%5D=55597056&gclid=CjwKCAjwpuajBhBpEiwA\\_ZtfhUphPlx216zq7xqJTaeTo\\_hSMa13\\_RytEAYAH\\_FLJwTlPfhayK-Qu5RoC2n8QAvD\\_BwE](https://www.wayfair.com/Royal-Shade--20-Triangle-Shade-Sail-rsTAPT20-L6989-K~FYAL1019.html?refid=GX657561173969-FYAL1019_55597056&device=c&ptid=1212241869960&network=g&targetid=pla-1212241869960&channel=GooglePLA&ireid=137483493&fdid=1817&PiID%5B%5D=55597056&gclid=CjwKCAjwpuajBhBpEiwA_ZtfhUphPlx216zq7xqJTaeTo_hSMa13_RytEAYAH_FLJwTlPfhayK-Qu5RoC2n8QAvD_BwE)
- Wilmoth, A. (2023). Average cost of furnishing an infant, toddler or preschool classroom. Kaplan. <https://blog.kaplanco.com/average-cost-of-furnishing-an-infant-toddler-or-preschool-classroom>

# Appendix A. Cost Study Methods

As described in the methods section, this study takes an approach related to the ingredients method to generate a list of resources for NR!PK and assign appropriate quantities and prices. This appendix details the calculations behind the cost estimates.

The overall approach was to use NR!PK program design information (from NR!PK Required Program Elements, Nevada Pre-K Standards, or Nevada Child Care Licensing Requirements) to detail the characteristics and quantities of each resource (as detailed in the Cost Study section). For example, NR!PK Required Program Elements dictate the qualifications of teachers, the minimum hours worked, and teacher/child ratio- thus allowing the study team to assign a quantity and prices.

As mentioned previously, for comparability and data reliability purposes, this study uses national data, adjusted for inflation to the study year (2021-22) and for regional variation by county (for prices that were impacted by regional variation). For non-personnel resources, including facilities and equipment, the cost is amortized to reflect only one year of cost. Facilities are based on a 30 year lifespan, outdoor equipment based on a 10 year lifespan, and equipment on a 5 year lifespan (CASP, 2021). The specific data used for these adjustments is described for each ingredient in the section below.

## Personnel

### Teachers

The quantity of teachers from each site was determined by dividing the number of students at each site by 20 (the max class size in the regulations) and rounding up to get the number of classrooms (1 FTE per classroom). The average teacher salary in Nevada was identified as the base price for teachers because the NR!PK program requires that NR!PK teachers are paid comparable to K-12 teachers. Rather than reflecting the current demand or market price for

NR!PK (which is described in the Salaries section), this price better reflects the investment determined by the standards.

The study team prorates this salary to the 25 hour work week, the minimum to meet the NR!PK Required Program Elements. A national benefits rate from the for Database of National Prices for Educational Resources “State/local government employees: Elementary/secondary school employees” was added to the salary to get total compensation (Chang ,Head, 2022). The prorated salaries and benefits comes out to \$59,823 per year.

Finally, the salary amount is adjusted for regional variation by county using the Comparable Wage Index for Teachers (CWIFT)(Cornman, Nixon, Spence, et al., 2019). The CWIFT uses wage data from non-education industries to construct a measure of the regional differences in wages without capturing district preferences that are not related to the region’s labor market. To create a CWIFT index to Nevada averages by county, each county’s CWIFT value was divided by the state’s CWIFT value. Then this value was multiplied by the prorated, benefits and inflation adjusted Nevada average teacher salary. Table A1. shows the CWIFT values and resulting prorated compensation amounts for the five case-study counties.

**Table A1. Modeling Regional Variation in Teacher Compensation using CWIFT, Selected Case Study Counties**

Case-Study County	Teacher Compensation (Nevada Average) *	County-Level CWIFT Value	Per Teacher Annual Compensation
Clark	\$59,823	1.02	\$60,738
Elko	\$59,823	1.09	\$65,129
Nye	\$59,823	0.95	\$57,079
Lyon	\$59,823	0.86	\$51,713
Washoe	\$59,823	0.98	\$58,482

Source: Study team’s calculation based on data from NCES and BLS, 2022

\*This column contains the NCES average salary for Nevada teachers, prorated for a 25-hour work week and with a benefits rate applied.

## Professional Development

Professional development is part of the NR!PK Required Program Elements. NR!PK teachers employed at LEA sites need to complete 6 credit hours (the equivalent of 90 clock hours over the five years or 15 clock hours per year) every 5 years (the same requirement as other licensed teachers), while center sites are required to complete 24 hours per year (NIEER, n.d.) Teachers have wide latitude to choose professional development that fits their interests and schedule.

For transparency and clarity, the study team chose four providers for the prekindergarten age group at random from the Nevada Registry’s approved list, though providers are allowed to look for options outside of this list (Nevada Registry, n.d). The average price of these four offerings was \$25 per clock hour. This was applied to each LEA teacher by multiplying it by the required hours (15 clock hours). Teachers at center-based sites are assigned similarly, multiplying the rate by 24 hours. This translates to \$375 per year per LEA teacher and \$600 for non-LEA teachers.

In addition to the cost of the course itself, these professional development activities also require the teacher time required to take the course. This is the teachers’ hourly compensation multiplied by the number of clock hours per year (15 for LEA teachers and 24 for center-based). The price was adjusted for regional variation using the county-level CWIFT (Cornman, Nixon, Spence, et al., 2019).

## Teaching Assistants

Teaching assistants’ quantities were determined by dividing the number of students at each site by 20 (the max class size in the regulations) and rounding up to get the number of classrooms (1 FTE per classroom).

The salary value for Teacher assistants comes from the Bureau of Labor Statistics data for “Teaching Assistants, Except Postsecondary” for the state of Nevada. The study team prorates this salary to the 25 hour work week, the minimum to meet the NR!PK requirements. The benefits rate for “State/local government employees: Elementary/secondary school employees” was applied to get total compensation (Chang, Head, 2022). This prorated total compensation comes to \$20,561 per year. Finally, the salary amount is adjusted for regional variation by county using the CWIFT (Cornman, Nixon, Spence, et al. 2019).



## Family Engagement

Based on engagements with NDE OELD and providers, review of the ePage budget data, and the NR!PK Required Program Elements, the study team gained an understanding of family engagement activities that take place as part of NR!PK. Based upon this information, several assumptions were made to calculate the amount of personnel time required to carry out these activities.

The study team assigned a quantity of .2 per classroom for this role- the equivalent of spending one working day per classroom or roughly 25 minutes per child per week based on a classroom of 20 children. The study team assumed that this role worked full-time including the summer, as they are likely a district or non-profit employee and therefore not on a 36-week educator schedule. This time is the study team’s assumption, and may be greater or less depending on the specific site needs or expectations for these roles.

The role is assigned the price of a Social and Community Service Manager from the Database of National Prices of Educational Resources (DNPER) (Chang, Head, 2022). The price is adjusted for inflation to 2022 constant dollars using the CPI.

The benefits rate for “State/local government employees: Elementary/secondary school employees” was applied. For each classroom, this comes out to total prorated compensation of \$24,810. Finally, CWIFT is applied to adjust prices for regional variation (Chang, Head, 2022; Cornman, Nixon, Spence, et al. 2019).

## Data Coordinator

Similar to the family engagement role, the study team had limited information to determine the time required for this role. The study team estimated the following workload, though these may vary by context. The team estimates that data entry at the beginning of the year (for enrollment) and at the end of year (for screenings and annual data collections) amounting to 2 hours per day for 2 weeks each time for each classroom. Additionally, outside of these 4 weeks, this role is estimated to work 2 hours per week, for a combined FTE of 0.04 per classroom. This estimate is based on limited FTE estimates in the role from ePage but these estimates were not available for all sites, and therefore this estimate may not reflect the cost in all cas-study areas.

This role is assigned the role of “Education Administrator” from the DNPER (Chang, Head, 2022). The price is adjusted for inflation to 2022 constant dollars using the CPI. The benefits

rate for “State/local government employees: Elementary/secondary school employees” was applied. The total prorated compensation comes to \$ 3,901 per year per classroom. Finally, the CWIFT was applied to adjust prices for regional variation (Chang, Head, 2022; Cornman, Nixon, Spence, et al. 2019).

## Site Facilities and Furnishings

Similar to teacher quantities (but unlike equipment), facilities are fixed costs, they do not increase or decrease based on number of children. Though some of the requirements are in per-student terms (for example, square foot per student), in practice this is not the way schools or child care centers are designed — space is not flexible to the number of children enrolled. Therefore, these spaces are designed as being set up for the maximum number of children allowing for the possibility of expansion up to that point.

Table A2. shows the related requirements for facilities in Nevada.

**Table A2. NR!PK Site Facilities & Furnishings Cost Assumptions**

Ingredient	Requirement	Price Source
Classroom	35 sq ft per child (Nevada Child Care Licensing Requirements)	DNPER Facilities Calculator
Furniture	Child-sized (ECERS III)	Kaplan; Local Initiatives Support Cooperation/Community Investment Collaborative for Kids.
M&O	NA	American School & University’s 36 <sup>th</sup> annual Maintenance and Operations Cost Study
Outdoor Space	37.5 sq ft per child (Nevada Child Care Licensing Requirements)	AIR California Pre-K Expansion Study

Ingredient	Requirement	Price Source
Playground	Gross motor equipment (ECERS III)	National Retailers
Playground Flooring	Protective fall zone (ECERS III)	National Retailers
Shade	5 sq ft per child May-Oct (Nevada Child Care Licensing Requirements)	National Retailers

### Classroom

Classroom facilities are calculated by square foot per child, as prescribed by the Nevada Child Care Licensing Requirements (in absence of requirements from NR!PK Required Program Elements or the Nevada Pre-K Standards). The guidance dictates 35 square feet of classroom space per child. This is multiplied by the max child count (20) for a total classroom size of 700 square feet. Using the DNPER facilities calculator, a standard pre-K classroom is \$19.07 per foot per year (the calculation assumes a lifespan of 30 years). This amount is multiplied by the classroom size of 700 square feet and adjusted for inflation for a total of \$15,326 per year per classroom. This price is adjusted for regional variation using an index calculated from the U.S. Department of Housing and Urban Development Fair Market Rent data set, which results in a price by county ranging from \$22,015 in Washoe to \$14,538 in Nye (U.S. Department of Housing and Urban Development, 2022). This amount is multiplied by the number of classrooms.

### Furniture

Furniture is not expressly listed in the Required Program Elements or Nevada Pre-K Standards, however furniture is an implied requirement for any classroom setup including child-sized desks and chairs, organizational units, and rugs. ECERS III (the rating scale used to evaluate the programs through the state’s QRIS system) provides general guidance, including that the furniture must be in good repair and be appropriate for the age and mix of children in the setting.

Rather than seek to determine which mix of furniture meets these general criteria, the study team used existing estimates for pre-K furniture from two sources, Kaplan and Local Initiatives

Support Cooperation/Community Investment Collaborative for Kids (Arthur, Lawson, Gillman, et al., 2006; Wilmoth, 2023). The study team adjusted the prices for inflation to 2022 constant dollars averaged these two prices together to determine an average price of furniture per classroom to be \$15,804 in total. This amount is amortized over 30 years, coming to roughly \$526 per classroom.

## Maintenance and Operations

Though not expressly named in program requirements, maintenance and operations (M&O) is a necessary cost to maintain all educational facilities. The quantity is related to the size of the space in square feet. Data from a survey of school districts, the American School & University's 36<sup>th</sup> Annual Maintenance and Operations Cost Study, provides a cost per square foot that was \$5.09 in the year of the data collection (Agron, 2007). This cost includes custodial services and utilities. When adjusted for inflation to 2022 constant dollars, this equates to roughly \$6.77 per square foot per year.

This cost is multiplied by total square footage, both for classrooms and the outdoor space. This is roughly \$10,158 per classroom per year. The study team made a choice to include regional variation in this cost because M&O are largely maintenance and facilities personnel costs, and therefore are tied to regional differences in labor. The study team created a county level index to show differences in labor prices using the American Community Survey, resulting in a \$12,223 per classroom total in Elko and a \$9,063 per classroom cost in Nye.

## Outdoor Space

Similar to classroom space, the amount of outdoor space is dictated by the Nevada Child Care Licensing Requirements, which require 37.5 square feet of outdoor space per child. This is multiplied by the max child count (20) for a total outdoor size of 750 square feet of outdoor space per classroom. The price per square foot comes from an American Institutes of Research estimation of the cost of preschool which was \$65 in 2006 dollars (Golin, Muenchow, Wang, Lam, 2007). The price is amortized based on a lifespan of 30 years. This value is adjusted for inflation using the CPI. and regional cost of land using the index constructed from the U.S. Department of Housing and Development Fair Market Rent data (U.S. Department of Housing and Development, 2022). This value was highest in Washoe at \$3,408 and lowest in Nye equaling \$ 1,963 per classroom per year. Finally, this number is multiplied by the number of classrooms.

## Playground

The study team defined playgrounds as part of ECERS III “gross motor” space (Harms, Clifford, Crye, 2015). In the absence of further specification for this subitem, the study team selected playgrounds from national realtors. The price is an average of 10 playgrounds from national realtors (PlaygroundBoss, 2022). The average price per playground was \$13,726. Because the study team obtained this price for the year after the year studied, this price is adjusted for inflation to 2022 constant dollars. The price is also amortized based on a lifespan of 10 years. With these adjustments, the cost of a playground is estimated to be \$1,345 per site per year. Each site is assigned one playground.

## Playground Flooring

ECERS III also requires proper flooring for the outdoor area- called the fall zone. This can be woodchips, rubber tiles, etc. There are advantages to each. Rather than selecting one option over the other, the study team averaged the cost of two options at different price points: three prices of rubber tiles and three of mulch (Rubber Flooring Inc, 2022; American Floormats, 2022a, 2022b; Home Depot, 2023b; Practice Sports, 2023; Rubber Mulch.com, 2023). This generates an approximate price for flooring. The average price per square foot was \$7.6 per square foot.

This was multiplied by the size of the outdoor space (37.5 square feet times the maximum of 20 children times the number of classrooms). This comes out to approximately \$5,702 per classroom. The price is adjusted to 2021-22 school year for inflation. Because providers would likely obtain these prices from national retailers, the prices are not adjusted for regional variation. The price is amortized based on a lifespan of 5 years. With the inflation and amortization adjustment, the price per classroom is roughly \$38.

## Shading

The Nevada Child Care Licensing Requirements r that shade be provided for 5 square feet per child in the months of May through October. To the study team, it seems that there are many ways this could be achieved, including through trees, the overhang of a building, umbrellas, or fabric shades. The most practical approach to estimating this as a cost was to provide an estimate of the fabric shade option. The average of 3 prices was \$1.28 per square foot (Covers & All, 2023; Wayfair, 2023; Home Depot, 2023). This was multiplied by the shaded area (5 square feet times the number of children at the site). The price is adjusted to 2021-22 school

year for inflation. The shades were assumed to have a lifespan of 5 years. After the inflation and amortization adjustments, this comes out to roughly \$25.10 per classroom per year.

## Equipment

Equipment for the NR!PK program is extensive. The NR!PK Required Program Elements do not explicitly list all of the equipment that is required for the program. However, they do say sites must participate in the state's QRIS, which has specifications for equipment and materials that are defined by the ECERS III. The ECERS III defines equipment which can be broken down into the following areas: furnishings, room arrangement for play and learning, interest areas, books, math, nature/science, art, and blocks.

The ECERS III is a very detailed scale with descriptions of learning materials and classroom settings that correspond to different ratings. An individual indicator might describe the number and type of items, such as manipulatives or books.

Neither the NR!PK Required Program Elements nor Nevada's QRIS system has a minimum ECERS III score for NR!PK providers to meet in order to meet the program requirements. Therefore, the study team had to determine what constituted an acceptable minimum score for NR!PK providers in order to include equipment and materials in the cost estimation. The study team based the list of equipment and materials on the ECERS III requirements for an average rating of 5.0 out of the 7.0 scale. This choice was made because NDE considers an average score of 4.5 or above to be high quality, and the ECERS III does not provide descriptions for 4.5, only a score of 3 or 5 (Nevada State Silver Stars QRIS, 2021). Table A3. contains information on the ECERS III item and which ingredients the study team assigned to fulfill that requirement.

Some subscales are not practical to cost out. For example, the subscales that the classroom should provide enough space for adequate space between furniture or for teachers to model reading and use of language. Some items can count toward multiple subscales as indicated in Table A3. by an asterisk. For example, bean bags can count toward soft furnishings as well as cozy interest area.

Because these items are so specialized, they are generally not included in databases of national educational prices like the DFEP. Therefore, the average of three prices were calculated based on prices from national retailers, for example Lakeshore Learning, Staples, Amazon and Oriental Trading.

These prices were collected after the study year, and therefore are adjusted for inflation to 2022 constant dollars. Because they come from national retailers, the study team does not expect that prices vary by state or county, and are not adjusted for regional variation.

**Table A3. NR!PK Equipment By ECERS III Subscale**

ECERS III Item	Rational	Example of Included Ingredients	Price Per Classroom	Price per student per Year (amortized)
<b>Furnishings</b>	Soft furnishings 2 furniture pieces for specific activity	Bean bag Dress-up center Sand Table	\$1,036.50	\$12.20
<b>Room arrangement for play and learning</b>	At least 5 interest areas represented (cozy, art, dramatic play/noisy play, sand table, fine motor)	See related subscale items	Included in other items	Included in other items
<b>Gross Motor &amp; Space for Gross Motor**</b>	Equipment stimulates at least 7 skills (e.g., catching, throwing, hanging)	Hula hoop, Balls	\$307.30	\$3.60
<b>Encouraging children’s use of books</b>	20 books for 10 children, or 30 books for 15 children, plus one more for each additional child.	Books	\$487.70	\$5.70
<b>Fine motor*</b>	10 different choices from at least 4 categories (interlocking building materials, art, manipulatives, puzzles)	Geometric connecting building blocks, Flower manipulative	\$333.20	\$3.90
<b>Art*</b>	At least one material from each category is accessible (drawing materials, paint, three-dimensional objects, collage materials, tools)	Crayons, Paint, Collage materials, Scissors and Paint rollers	\$266.50	\$3.10
<b>Blocks</b>	Blocks and accessories from three categories (unit and large hollow blocks; small	Wooden blocks; Cardboard house kit;	\$636.4	\$7.50

ECERS III Item	Rational	Example of Included Ingredients	Price Per Classroom	Price per student per Year (amortized)
	people, vehicles, and animal accessories)	Wooden people, animal and vehicle figurines		
<b>Music</b>	Many (At least 10) music materials	Instruments (kids drums, maracas, etc.)	\$70.40	\$.80
<b>Nature/Science*</b>	At least 15 nature/science materials, some from each of the 5 listed category, are accessible in clearly defined nature/science interest area	Nature puzzle, Flower manipulative, Sand table, Nature books, magnets, flashlights	\$846.90	\$10.00
<b>Math*</b>	At least 10 different appropriate math materials, with at least 3 from 3 of the categories listed (counting/comparing quantities; measuring/comparing sizes and parts of wholes; familiarity with shapes)	Geometric connecting building blocks; coins, foam pattern blocks, clock, base 10 units, measuring cup, ruler	\$459.9	\$5.40

\* Indicates that items in this category count toward other categories as well. For example, nature books count toward the Nature/ science category as well as the use of books category.

\*\* This category also includes playground and playground flooring, which are described in the facilities section. The price published here does not include those categories.

## Curriculum

As described in the Equipment & Materials section, the requirement that the curriculum is evidence-based forms the conceptual basis for the cost estimate. Using the What Works Clearinghouse (WWC), a federal resource on evidence-based practices, the team selected three comprehensive pre-K curriculum, and summed the cost of one literacy and one math curriculum (to approximate a comprehensive curriculum) and averaged the yearly costs of these four curricula to get an average price per classroom (the WWC reports cost on a per classroom basis). The unadjusted per classroom price of these curricula ranged from \$1,995 (2013 price) to \$4,342 (2008 price). The prices of the four curricula were adjusted to the 2022 dollars using the CPI and then averaged together to arrive at an average per classroom price.



The average price per classroom in 2022 constant dollars was \$3,770. The estimated average cost of curriculum is an average of \$217 per child, or roughly 2.6 percent of the total cost of the requirements.

## Food

Serving nutritious food is outlined in the Nevada Pre-K Standards. The price of school nutrition is calculated from the National Public Education Financial Survey collection from 2019-20. To calculate a per-pupil amount, the food service expenditures variable (variable E3A1) is divided by number of pupils (Cornman, Doyle, Howell, et al., 2022). This provides a Nevada specific per-pupil number- roughly \$385 per pupil. This amount is adjusted for inflation using the CPI to the 2021-22 school year. After these adjustments, the per-child amount is roughly \$512.

This value includes the cost of food but also food service personnel. In some settings, there is not a separate staff role- food is prepared by a teacher or administrator, and therefore the actual incurred costs may be lower. However, this study does not seek to separate out the personnel cost from the cost of other nutrition resources because there is an associated value of this time and activity.

# Appendix B. Professional Panel Protocols Questions

## Professional Panel I: January 27, 2023

During the January convening, WestEd presented interim NR!PK cost study and equity and access findings and asked the participants the following questions:

1. Based on the NR!PK standards, are there any costs you would add to the funding formula?
2. Does anything about the per-pupil cost analysis surprise you? Does the regional difference in per-pupil cost resonate with you?
3. What challenges are providers facing that might impact the costs of operating NR!PK?
4. What additional information is needed to inform potential seat cost policy adjustments?
5. What changes in policies or practices might help increase equitable access to high-quality NR!PK?
6. What types of resources would have the greatest positive effect on the success of NR!PK programs?
7. What other non-resources would have the greatest positive effect on the success of
8. What challenges do you anticipate these findings creating when planning for the regulatory funding formula change

## Professional Panel II: April 3, 2023

During the April convening, WestEd shared salary data from the five case-study regions and common state policies on increasing Pre-K compensation and tools on increasing Pre-K equity and access and posed the following questions:

1. Which state examples of Pre-K fundings policies could work in the Nevada context?
2. Should any recommendations be eliminated?
3. How is the current requirement that salaries align with K-12 salaries working for NR!PK?
4. What additional information do you need to resolve the issue of salary discrepancies?
5. What factors might affect access and use of NR!PK among families in rural and urban communities, respectively?

# Appendix C. Accessibility Methods

## Enhanced Two-Stage Floating Catchment Area Approach

The accessibility analysis presented here uses an “enhanced” two-stage floating catchment area method (E2SFCA) (Luo, Qi., 2009). It improves upon the basic 2SFCA method developed by Radke and Mu (2000) and revised by Luo and Wang (2003) by introducing a weighting function to account for distance decay between service providers and the populations needing services. This method is implemented in two stages.

In the first step, accessibility is determined at each service point  $j$  using the formula:

$$R_j = \frac{S_j}{\sum_{k \in \{d_{kj} \leq d_0\}} P_k W}$$

where  $P_k$  stands for the demand at location  $k$  (specifically, the number of children aged 4-5 years in households with median incomes below 200% of the federal poverty line), whose population-weighted center lies within catchment  $j$  ( $d_{ji} \leq d_0$ ).  $S_j$  represents the service availability at location  $j$  (in this context, the count of NR!PK seats), and  $d_{kj}$  signifies the distance or time taken to travel between locations  $j$  and  $k$ . A Gaussian decay function,  $W$ , adjusts this distance to ensure weights decrease as the distance or travel time increases, and does so more rapidly the closer one gets to the catchment area threshold  $d_0$  (as per Kwan, 1998; Wang, 2007; Alford et al., 2008).

In the second step, for each population location  $i$ , find all NR!PK locations ( $j$ ) that are within the distance or travel time threshold of catchment area  $i$ . The ratios of seats to population,  $R_j$ , calculated in step 1 are then aggregated for these locations as:

$$A_i^F = \sum_{j \in \{d_{ij} \leq d_0\}} R_j W$$

where  $A_i^F$  denotes the accessibility of the population at location  $i$  to services,  $R_j$  refers to the ratio of seats to population at NR!PK location  $j$  that is within the catchment centered on the population at location  $i$  (i.e.,  $(d_{ji} \leq d_0)$ ), and  $d_{ij}$  represents the travel time between locations  $i$  and  $j$ . The same Gaussian weighting function ( $W$ ) from step 1 is used here to account for distance decay.

### Gaussian Weighting Function

Distance or travel time weights are calculated using the following:

$$w = \frac{1}{\sqrt{2\pi}} e^{-\frac{1}{2}\left(\frac{x}{y}\right)^2}$$

where  $w$  represents the Gaussian weight for a given distance or travel time span,  $x$  is the distance or travel time vector,  $y$  is the threshold (e.g., 3 miles or 20 minutes), and  $e$  denotes the exponential function. The portion  $\frac{1}{\sqrt{2\pi}}$  is the normalization constant and  $\frac{1}{2}\left(\frac{x}{y}\right)^2$  is the exponent of  $e$  in the Gaussian function that ensures that weights decrease with increased distance or travel time and that they decline more sharply relative to the catchment area limit,  $d_0$  (ibid.).

### Getis-Ord $G_i^*$

The Getis-Ord  $G_i^*$  statistic is a measure used to identify spatial clustering of high or low values in a dataset. Here’s the formula for calculating the Getis-Ord  $G_i^*$  statistic:

$$G_i^* = \frac{\sum_{j=1}^n w_{ij} x_j - \bar{x} \sum_{j=1}^n w_{ij}}{S \sqrt{\frac{n \sum_{j=1}^n w_{ij}^2 - (\sum_{j=1}^n w_{ij})^2}{n-1}}}$$

Where ( $G_i^*$ ) is the Getis-Ord  $G_i^*$  statistic for location ( $i$ ), ( $n$ ) is the total number of locations, ( $w_{ij}$ ) is the spatial weight between location ( $i$ ) and location ( $j$ ), ( $x_j$ ) is the attribute value for location ( $j$ ), ( $\bar{x}$ ) is the mean of the attribute values, and ( $S$ ) is the standard deviation of the attribute values.

The sum is taken over all ( $n$ ) locations, including location ( $i$ ) itself. This statistic helps to assess whether the local region (in the context of the surrounding locations) has unusually high or low

values. When  $(G_i^*)$  is significantly high, it indicates a clustering of high values, and when it's significantly low, it indicates a clustering of low values