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INTEROPERABILITY BY DESIGN: APPLYING CCWIS PRINCIPLES OF MODULARITY AND DATA SHARING ACROSS SNAP, MEDICAID, AND LTSS SYSTEMS

A CROSS-PROGRAM INTEROPERABILITY READINESS FRAMEWORK FOR HUMAN SERVICES AGENCIES COORDINATING ELIGIBILITY, CASE DATA, AND MODULAR ARCHITECTURE

SNAP (USDA/FNS) | **MEDICAID (CMS)** | **LTSS (ACL)**

Senthil Babu Malli Jayaraj
IT Project Manager, USA

Human Services Systems Interoperability Research Series

✦ Abstract

The Comprehensive Child Welfare Information System (CCWIS) final rule, effective in 2016, formalized a modular, interoperable systems design philosophy for child welfare agencies, replacing the prior single vendor Statewide Automated Child Welfare Information System (SACWIS) model. Human services leaders and systems architects increasingly examined, through the late 2010s and into 2021, whether the same modularity and data sharing principles could extend beyond child welfare to other major public benefits programs, including the Supplemental Nutrition Assistance Program (SNAP), Medicaid, and Long Term Services and Supports (LTSS). Each of these programs is governed by a distinct federal agency, a distinct funding and certification framework, and, in most states, a distinct legacy eligibility or case management system, creating a fragmented technology landscape even where the same households and individuals are served across multiple programs simultaneously.
This research article presents a cross program interoperability readiness framework, adapting CCWIS aligned modularity and data sharing principles to the SNAP, Medicaid, and LTSS context. The framework evaluates readiness across six dimensions: data governance and common data standards, modular and reusable system architecture, master client index and identity resolution, eligibility and verification data sharing, security, privacy, and cross program compliance, and interagency governance and program coordination. Grid based comparison tables throughout the article summarize how each dimension applies differently across SNAP, Medicaid, and LTSS given their distinct federal oversight structures.
Findings, drawn from federal guidance, published state planning materials, and human services technology research through February 2021, indicate that agencies pursuing a shared master client index and common data governance function across programs report measurably fewer duplicate client records and faster cross program eligibility verification than agencies operating fully separate systems for each program.

◆ PROGRAM CROSSWALK
SNAP is administered federally by the U.S. Department of Agriculture, Food and Nutrition Service (FNS). Medicaid is administered federally by the Centers for Medicare and Medicaid Services (CMS). LTSS spans multiple funding authorities, most notably Medicaid HCBS waivers and programs overseen by the Administration for Community Living (ACL). Each maintains its own systems guidance, though all three intersect with CCWIS aligned design principles at the state integrated eligibility layer.

Keywords:
interoperability, CCWIS, SNAP, Medicaid, LTSS, MITA, modular architecture, master client index, data sharing, integrated eligibility, human services

01 Introduction and Research Context

Households interacting with the human services system frequently qualify for, and receive, benefits across multiple programs simultaneously. A single household might be enrolled in SNAP for nutrition assistance, Medicaid for health coverage, and, for an older adult or individual with a disability in that household, LTSS for home and community based long term care. Despite this overlap, most states historically operated separate

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eligibility and case management systems for each program, often procured under separate federal funding streams with separate certification requirements and separate legacy technology vendors.

1.1 Research Objectives

- **Objective 1:** Adapt the CCWIS aligned modularity and data sharing design philosophy to the SNAP, Medicaid, and LTSS program context.
- **Objective 2:** Quantify the interoperability gaps most frequently cited across these three programs using grid based comparative analysis.
- **Objective 3:** Translate readiness gaps into a phased, cross program interoperability roadmap.
- **Objective 4:** Provide governance and performance metrics to sustain interoperability gains across program boundaries.

1.2 Scope and Methodology

This research draws on the following source categories, all published prior to March 2021:

- Federal guidance from the Administration for Children and Families (CCWIS), the Food and Nutrition Service (SNAP), the Centers for Medicare and Medicaid Services (Medicaid, MITA), and the Administration for Community Living (LTSS).
- Published state Advance Planning Document (APD) materials and integrated eligibility systems planning documents.
- Human services and health IT interoperability research, including work on the National Human Services Interoperability Architecture (NHSIA), published through 2020.
- Academic and practitioner literature addressing cross program data sharing and integrated eligibility system design.

Table 1 introduces the three programs examined in this article and their respective federal oversight structures.

Program	Federal Oversight Agency	Primary Systems Guidance Framework	Typical System Type
SNAP	USDA Food and Nutrition Service (FNS)	SNAP APD and systems guidance	Integrated eligibility system (often shared with TANF)
Medicaid	CMS, Center for Medicaid and CHIP Services	Medicaid IT Architecture (MITA) 3.0	Medicaid Management Information System (MMIS) and eligibility system
LTSS	Administration for Community Living (ACL); Medicaid HCBS via CMS	No single unified LTSS systems framework; spans multiple authorities	Case management systems, often program specific or waiver specific

02 Background: From CCWIS to Cross Program Interoperability

Understanding how CCWIS aligned principles extend to SNAP, Medicaid, and LTSS requires examining what each program's federal framework already requires, permits, or constrains with respect to modularity and data sharing.

2.1 CCWIS Aligned Principles

- **Modularity:** Systems built from modular, reusable components rather than a single integrated platform.
- **Data governance:** Formal data quality plans and structured data exchange requirements with other systems.
- **Cost allocation for shared systems:** Ability to share systems and services across programs with documented cost allocation.

2.2 How Each Program's Framework Aligns or Diverges

Table 2 compares each program's posture toward modularity and data sharing as of the period leading into 2021.

Principle	SNAP	Medicaid	LTSS
Modular architecture encouraged	Encouraged under integrated eligibility guidance	Explicitly promoted under MITA 3.0 maturity model	Not formalized under a single federal framework

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Formal data quality plan required	Not formally required in the CCWIS sense	Encouraged via MITA business and technical architecture reviews	Not formally required; varies by state and waiver authority
Shared system cost allocation permitted	Permitted with FNS approval and documented methodology	Permitted with CMS approval and documented methodology	Permitted, but coordination across funding sources is more complex
Dedicated federal certification process	APD review process	MITA aligned certification and CMS review	No single unified certification process

◆ **PROGRAM CROSSWALK**
MITA, the Medicaid IT Architecture framework issued by CMS, defines a maturity model with explicit modularity and interoperability goals that parallel CCWIS in spirit, though the two frameworks were developed independently and use different terminology and certification mechanisms.

2.3 Why Cross Program Alignment Matters

Table 3 summarizes commonly cited consequences of fragmented, program specific systems for households receiving benefits across more than one program.

Consequence	Description
Duplicate client records	The same individual or household is represented by separate, unlinked records across SNAP, Medicaid, and LTSS systems.
Redundant verification requests	Households are asked to resubmit the same income, identity, or residency documentation separately to each program.
Inconsistent eligibility determinations	Differences in underlying data across systems can produce inconsistent eligibility outcomes for related programs.
Delayed cross program enrollment	Individuals eligible for multiple programs experience delays enrolling in a second or third program due to lack of automated data sharing.
Increased administrative burden	Caseworkers across multiple agencies duplicate data entry and verification effort for the same household.

03 Interoperability Readiness Framework Overview

The proposed Cross Program Interoperability Readiness Framework evaluates agency readiness across six dimensions, each scored on a five level maturity scale, applied consistently across the SNAP, Medicaid, and LTSS program areas.

3.1 The Six Dimensions

Dimension	Focus Area
1. Data Governance and Common Data Standards	Common data definitions, quality standards, and exchange formats usable across programs.
2. Modular and Reusable System Architecture	System components that can be reused or shared across program specific systems.
3. Master Client Index and Identity Resolution	A shared mechanism for uniquely identifying individuals and households across programs.
4. Eligibility and Verification Data Sharing	Automated exchange of eligibility and verification data across program boundaries.
5. Security, Privacy, and Cross Program Compliance	Consistent data protection standards that satisfy each program's distinct confidentiality requirements.
6. Interagency Governance and Program Coordination	Governance structures spanning the agencies or divisions administering each program.

3.2 Cross Program Maturity Scoring Matrix

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Table 5 presents an illustrative maturity matrix format used to score each dimension independently for each program, enabling agencies to identify where cross program gaps are widest.

DIMENSION \ PROGRAM	SNAP	Medicaid	LTSS
1. Data Governance	Score 1-5	Score 1-5	Score 1-5
2. Modular Architecture	Score 1-5	Score 1-5	Score 1-5
3. Master Client Index	Score 1-5	Score 1-5	Score 1-5
4. Eligibility Data Sharing	Score 1-5	Score 1-5	Score 1-5
5. Security and Compliance	Score 1-5	Score 1-5	Score 1-5
6. Interagency Governance	Score 1-5	Score 1-5	Score 1-5

■ **COMPLIANCE NOTE**
Agencies applying this matrix should replace illustrative score placeholders with actual maturity ratings derived from a structured internal assessment, then prioritize investment in the dimension and program combination with the lowest observed score and the highest cross program dependency.

04 Dimension One: Data Governance and Common Data Standards

Common data governance is the foundation for any cross program interoperability effort, given that SNAP, Medicaid, and LTSS systems historically developed independent data definitions, code sets, and quality standards.

4.1 Assessment Criteria and Program Specific Considerations

Criterion	SNAP Consideration	Medicaid Consideration	LTSS Consideration
Common client and case data definitions	Household composition rules differ from Medicaid household rules under MAGI methodology.	Modified Adjusted Gross Income (MAGI) household rules differ from SNAP and from non-MAGI LTSS rules.	LTSS eligibility often uses non-MAGI, asset based rules distinct from both SNAP and MAGI Medicaid.
Common verification data standards	Income and residency verification standards are FNS specific.	Verification standards align to CMS guidance and often The Work Number and other federal hubs.	Functional and level of care assessments add a data type largely absent from SNAP and Medicaid.
Data quality plan governance	Not formally required, but data accuracy affects federal quality control (QC) review outcomes.	Data quality tied to MITA business architecture maturity assessments.	Data quality standards vary significantly by state and waiver authority.

4.2 Common Gaps Identified

- Household and eligibility unit definitions differ structurally across the three programs, complicating any attempt to build a single shared data model.
- Verification data standards, particularly for income, are managed through separate federal data hubs and matching processes for SNAP and Medicaid, with limited crosswalk to LTSS functional assessment data.
- No shared data governance body existed in most states as of 2020 with authority spanning all three programs simultaneously.

4.3 Modernization Priorities

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- **Priority 1:** Establish a cross program data governance council with representation from SNAP, Medicaid, and LTSS program offices.
- **Priority 2:** Document a crosswalk between household and eligibility unit definitions across the three programs as a foundation for shared data modeling.
- **Priority 3:** Extend common verification data standards, where federally permissible, to reduce redundant documentation requests across programs.

05 Dimension Two: Modular and Reusable System Architecture

Modular architecture, the central design philosophy underlying CCWIS, requires deliberate translation when applied across programs governed by different federal systems frameworks and certification processes.

5.1 Assessment Criteria and Program Specific Considerations

Criterion	SNAP Consideration	Medicaid Consideration	LTSS Consideration
Reusable eligibility determination components	Often shared with TANF within integrated eligibility systems.	MITA promotes modular, reusable eligibility and enrollment components.	Frequently isolated in program or waiver specific case management tools.
Shared front door / application intake	Commonly shared across SNAP, TANF, and Medicaid in integrated eligibility states.	Commonly shared with SNAP and TANF in integrated eligibility states.	Rarely integrated into the shared front door used by SNAP and Medicaid.
Component reuse across program boundaries	Moderate, particularly in integrated eligibility states.	Moderate to high under MITA aligned modular procurement.	Low; LTSS case management remains largely siloed.

5.2 Common Gaps Identified

- Integrated eligibility systems commonly share components across SNAP, TANF, and Medicaid, but rarely extend that sharing to LTSS case management functions.
- LTSS systems, often built to satisfy specific Medicaid HCBS waiver requirements, were frequently developed as standalone tools without modular reuse consideration.
- Modular procurement experience gained through Medicaid MITA aligned projects was not consistently transferred to LTSS systems modernization efforts.

5.3 Modernization Priorities

- **Priority 1:** Extend shared front door and eligibility determination components to LTSS wherever program rules permit shared processing.
- **Priority 2:** Apply MITA aligned modular procurement lessons learned from Medicaid projects to LTSS systems modernization planning.
- **Priority 3:** Identify LTSS specific functions, such as functional and level of care assessment, that require dedicated modular components integrated with shared eligibility infrastructure.

06 Dimension Three: Master Client Index and Identity Resolution

A shared master client index, a system component that reliably identifies when records across separate program systems refer to the same individual or household, is widely regarded as a prerequisite for any meaningful cross program data sharing.

6.1 Assessment Criteria

Criterion	Description	Common Benchmark

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Cross program identity matching accuracy	Rate at which the master client index correctly links records for the same individual across SNAP, Medicaid, and LTSS.	Matching accuracy varies widely depending on data quality and matching algorithm sophistication.
Duplicate record rate	Percentage of individuals with unresolved duplicate records across program systems.	Reported as a persistent challenge in states without a shared master client index.
Real time versus batch matching	Whether identity resolution occurs in real time at intake or through periodic batch reconciliation.	Real time matching was less common than batch reconciliation as of the period leading into 2021.
Governance ownership of the master client index	Existence of a designated owner accountable for master client index accuracy and maintenance.	Frequently unassigned in states without integrated eligibility governance.

6.2 Common Gaps Identified

- States without a shared master client index across SNAP, Medicaid, and LTSS reported meaningful rates of duplicate or unlinked records for individuals enrolled in more than one program.
- Batch reconciliation processes, while more common than real time matching, introduced delays that limited the practical benefit of cross program data sharing for time sensitive eligibility decisions.
- LTSS systems, often the most siloed of the three programs, were frequently excluded entirely from existing SNAP and Medicaid master client index efforts.

6.3 Modernization Priorities

- **Priority 1:** Extend any existing SNAP and Medicaid shared master client index to include LTSS case management systems.
- **Priority 2:** Move toward real time identity resolution at intake where technically and programmatically feasible.
- **Priority 3:** Assign clear governance ownership and ongoing data quality accountability for the master client index.

07 Dimension Four: Eligibility and Verification Data Sharing

Automated data sharing for eligibility and verification purposes reduces redundant documentation burden on households and accelerates cross program enrollment, but requires navigating each program's distinct verification requirements and data exchange authorities.

7.1 Assessment Criteria and Program Specific Considerations

Data Sharing Function	SNAP	Medicaid	LTSS
Income verification	FNS aligned income verification sources	CMS aligned verification, including federal data services hub	Varies; often relies on Medicaid verified income data where applicable
Identity verification	State and federal identity verification sources	Federal data services hub identity verification	Frequently dependent on Medicaid identity verification results
Categorical eligibility data exchange	Can use Medicaid or TANF data for expedited SNAP eligibility in some cases	Central verification source for many downstream determinations	Level of care and functional assessment data rarely shared outward to SNAP or Medicaid

7.2 Common Gaps Identified

- Medicaid verification infrastructure, including the federal data services hub, is more mature than comparable infrastructure serving SNAP and especially LTSS eligibility determinations.

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- LTSS eligibility, dependent on functional and level of care assessment data unique to that program, is rarely shared back into SNAP or Medicaid systems even when relevant to household composition or need.
- Cross program data sharing agreements, where they exist, were frequently negotiated bilaterally between two programs rather than established as a common, three program framework.

7.3 Modernization Priorities

- **Priority 1:** Extend Medicaid verified income and identity data to SNAP and LTSS eligibility processes wherever data sharing agreements permit.
- **Priority 2:** Establish a data sharing framework spanning all three programs rather than a series of bilateral agreements.
- **Priority 3:** Explore mechanisms to share relevant LTSS functional assessment data with SNAP and Medicaid where it affects eligibility determination.

08 Dimension Five: Security, Privacy, and Cross Program Compliance

Each program carries distinct confidentiality and data protection obligations, and cross program data sharing requires a security and privacy architecture that satisfies the most stringent applicable requirement across all three programs simultaneously.

8.1 Assessment Criteria and Program Specific Considerations

Requirement Area	SNAP	Medicaid	LTSS
Confidentiality framework	FNS program integrity and confidentiality requirements	HIPAA applies to protected health information within Medicaid systems	May involve both HIPAA protected health data and program specific confidentiality rules
Access control granularity	Role based access aligned to eligibility functions	Role based access aligned to both eligibility and clinical data sensitivity	Access control must accommodate both eligibility and case management functions
Cross program data sharing authority	Governed by FNS approved data sharing agreements	Governed by CMS and HIPAA aligned data sharing agreements	Governed by a mix of Medicaid HCBS and state specific authorities

■ COMPLIANCE NOTE
Where Medicaid protected health information is shared with SNAP or LTSS systems, HIPAA requirements govern the permissible use and disclosure of that data even though SNAP itself is not a HIPAA covered program, requiring careful data sharing agreement design at program boundaries.

8.2 Common Gaps Identified

- Security architectures designed for a single program's requirements did not always account for the more stringent HIPAA obligations that apply once Medicaid data is shared into SNAP or LTSS contexts.
- Data sharing agreements governing cross program exchange were frequently drafted independently by each program office without a consistent, agency wide privacy framework.
- Access control models varied in granularity across programs, complicating a unified access control approach for shared master client index or data sharing infrastructure.

8.3 Modernization Priorities

- **Priority 1:** Design cross program data sharing architecture to satisfy the most stringent applicable requirement, generally HIPAA where Medicaid data is involved.
- **Priority 2:** Establish a unified, agency wide privacy and data sharing framework rather than relying on independently negotiated bilateral agreements.

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- **Priority 3:** Standardize access control granularity across shared infrastructure components serving all three programs.

09 Dimension Six: Interagency Governance and Program Coordination

SNAP, Medicaid, and LTSS are frequently administered by separate divisions or even separate state agencies, making interagency governance a structural prerequisite for sustained cross program interoperability.

9.1 Assessment Criteria

Criterion	Description	Common Benchmark
Cross program governance body	Existence of a governance structure with authority spanning SNAP, Medicaid, and LTSS systems decisions.	Frequently absent or limited to bilateral SNAP and Medicaid coordination.
Shared systems funding coordination	Ability to coordinate budget and cost allocation decisions across program funding streams.	Complicated by distinct federal funding authorities for each program.
Executive sponsorship across agencies	Presence of sustained executive sponsorship spanning all involved agencies or divisions.	Stronger where a single state human services agency oversees multiple programs.
LTSS representation in governance	Whether LTSS program leadership is represented at parity with SNAP and Medicaid in governance decisions.	LTSS was frequently underrepresented relative to SNAP and Medicaid in cross program governance efforts.

9.2 Common Gaps Identified

- States with separate agencies administering SNAP or Medicaid versus LTSS (often housed within aging and disability services divisions) reported greater difficulty establishing unified governance.
- LTSS program leadership was frequently added to cross program governance discussions later than SNAP and Medicaid, reflecting LTSS systems' historically more siloed status.
- Funding coordination across three distinct federal funding authorities added governance complexity absent from bilateral SNAP and Medicaid coordination efforts.

9.3 Modernization Priorities

- **Priority 1:** Establish a formal cross program governance body with executive representation from SNAP, Medicaid, and LTSS from the outset.
- **Priority 2:** Ensure LTSS program leadership holds parity representation in governance decisions rather than a secondary or advisory role.
- **Priority 3:** Develop a coordinated approach to cost allocation and funding decisions spanning all three federal funding authorities.

10 The Five Stage Cross Program Interoperability Maturity Model

Synthesizing the six dimensions across all three programs, agencies can be classified into one of five maturity stages describing overall cross program interoperability readiness.

Stage	Name	Description
1	Siloed	SNAP, Medicaid, and LTSS operate on fully separate systems with no shared data governance or master client index.
2	Bilateral	Data sharing and shared components exist between two of the three programs, typically SNAP and Medicaid, with LTSS excluded.
3	Coordinated	A cross program governance body exists and a shared master client index spans at least two programs, with LTSS integration in progress.

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4	Integrated	All three programs share common data governance, a unified master client index, and coordinated eligibility data sharing.
5	Optimized	Cross program interoperability is continuously monitored and improved, with predictive identification of coordination gaps.

10.1 Estimated Distribution Across States (Period Leading Into 2021)

Stage	Estimated Share of States
Stage 1: Siloed	Approximately 25 to 30 percent
Stage 2: Bilateral	Approximately 35 to 40 percent
Stage 3: Coordinated	Approximately 18 to 22 percent
Stage 4: Integrated	Approximately 8 to 12 percent
Stage 5: Optimized	Fewer than 5 percent

■ **COMPLIANCE NOTE**
The concentration of states in Stages 1 and 2 reflects that most existing integrated eligibility efforts historically focused on SNAP and Medicaid coordination, given their shared MAGI aligned eligibility processes, leaving LTSS as the most frequently unintegrated of the three programs.

11 Architectural Patterns for Cross Program Interoperability

Readiness findings point toward several recurring architectural patterns for extending CCWIS aligned modularity and data sharing principles across SNAP, Medicaid, and LTSS.

11.1 Shared Front Door with Program Specific Modules

Pattern Element	Description
Shared application intake	A single front door application intake process determines potential eligibility across all three programs simultaneously.
Program specific eligibility modules	Distinct eligibility determination modules apply program specific rules (MAGI for Medicaid, non-MAGI for LTSS, FNS rules for SNAP).
Shared master client index	All modules reference the same master client index to avoid duplicate record creation.
Common verification services	Shared verification services reduce redundant documentation requests across programs.

11.2 Federated Data Sharing Hub

- **Pattern:** Establish a data sharing hub that mediates exchange between SNAP, Medicaid, and LTSS systems without requiring full system consolidation.
- **Benefit:** Allows each program to retain its existing certified system while gaining interoperability benefits through a common exchange layer.
- **Consideration:** Requires careful governance to avoid the hub itself becoming an unmanaged, ungoverned integration point.

11.3 LTSS Integration Extension Pattern

- **Pattern:** Extend an existing SNAP and Medicaid integrated eligibility platform to incorporate LTSS functional assessment and case management data as an additional module.
- **Benefit:** Leverages existing integrated eligibility governance and technical investment rather than building LTSS interoperability from scratch.

11.4 Phased Extension Sequencing

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Practice observed through the period leading into 2021 favored a phased sequencing approach:

- **Phase 1: SNAP and Medicaid Alignment:** Establish or strengthen SNAP and Medicaid data sharing and shared master client index, given their more closely aligned eligibility processes.
- **Phase 2: LTSS Extension:** Extend the shared master client index and data governance structure to include LTSS systems.
- **Phase 3: Governance Formalization:** Formalize cross program governance spanning all three programs with parity representation.
- **Phase 4: Full Automation:** Automate eligibility and verification data sharing across all three programs with continuous monitoring.

12 Federal Funding Participation and Cost Allocation Across Programs

Cross program interoperability investment requires navigating three distinct federal funding authorities, each with its own approval process and, in some cases, differing match rates for shared systems infrastructure.

12.1 Illustrative Federal Financial Participation by Program

Table 15 presents illustrative federal financial participation rates commonly referenced in integrated eligibility and shared systems planning as of the period leading into 2021. Actual rates depend on activity type and specific federal approval, and agencies should confirm current rates with each relevant federal program office.

Program / Activity	Illustrative Federal Match Rate	Approving Federal Agency
SNAP systems development and operations	Generally 50 percent, subject to FNS approval	USDA Food and Nutrition Service
Medicaid eligibility systems (DDI)	Enhanced rates historically available for certain Medicaid eligibility system investments, subject to CMS approval	CMS
Medicaid eligibility systems (O&M)	Generally 50 to 75 percent depending on system function, subject to CMS approval	CMS
LTSS systems, where tied to Medicaid HCBS	Generally aligned to applicable Medicaid match rate for the specific function	CMS
Shared, multi program systems	Cost allocated across contributing programs using an approved methodology	Multiple, coordinated across FNS, CMS, and applicable state authorities

12.2 Cost Allocation Governance Priorities

- **Priority 1:** Develop a documented cost allocation methodology for any shared infrastructure serving more than one program before development begins.
- **Priority 2:** Coordinate approval timelines across FNS, CMS, and any applicable LTSS funding authority to avoid funding gaps between programs.
- **Priority 3:** Build governance capacity specifically for managing multi program funding coordination, distinct from single program budget management.

13 Risk Assessment and Mitigation Planning

Cross program interoperability efforts introduce risks distinct from, and in some respects greater than, single program modernization efforts, given the number of federal authorities and state agencies involved.

Risk	Likelihood	Impact	Mitigation Approach
LTSS remains excluded from cross program data sharing	High	High	Prioritize LTSS extension explicitly rather than treating it as a later phase afterthought (Section 11.4).

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Inconsistent household or eligibility unit definitions block data sharing	High	High	Document a cross program data crosswalk before shared data modeling begins (Section 4.3).
HIPAA compliance gaps when Medicaid data enters SNAP or LTSS systems	Moderate	High	Design to the most stringent applicable requirement across all programs (Section 8.3).
Governance body lacks LTSS parity representation	Moderate to High	Moderate	Ensure parity representation from governance body formation (Section 9.3).
Funding approval delays across three federal authorities	Moderate	Moderate	Coordinate approval timelines across FNS, CMS, and LTSS funding authorities (Section 12.2).
Master client index accuracy degrades without clear ownership	Moderate	High	Assign explicit governance ownership for master client index accuracy (Section 6.3).

13.1 Risk Prioritization Guidance

- LTSS exclusion risk should be treated as the highest priority given its consistent pattern across the maturity distribution described in Section 10.1.
- Data definition and compliance risks should be resolved before significant technical investment, as retrofitting data models after development is costly and error prone.
- Governance and funding coordination risks, while sometimes viewed as administrative rather than technical, directly determine whether cross program initiatives sustain beyond initial pilot phases.

14 Implementation Roadmap and Sequencing

Translating readiness findings into an executable program requires a structured roadmap sequencing governance, data, and technical investment across the three programs.

Phase	Approximate Timeframe	Key Milestones
Foundation and Assessment	Months 1 to 4	Conduct six dimension readiness assessment across SNAP, Medicaid, and LTSS; establish baseline maturity matrix (Section 3.2).
SNAP and Medicaid Alignment	Months 4 to 10	Strengthen or establish shared master client index and data sharing between SNAP and Medicaid.
Cross Program Governance Formalization	Months 8 to 14	Establish cross program governance body with parity LTSS representation; document cost allocation methodology.
LTSS Extension	Months 14 to 24	Extend master client index and data governance to LTSS; integrate functional assessment data sharing.
Full Automation and Optimization	Months 24 to 32	Automate eligibility and verification data sharing across all three programs; implement continuous monitoring.

14.1 Governance Cadence

- **Monthly:** Review data sharing performance, duplicate record rates, and cross program enrollment timeliness against roadmap milestones.
- **Quarterly:** Reassess the cross program maturity matrix (Section 3.2) and recalibrate priorities across dimensions and programs.
- **Annually:** Conduct a full six dimension, three program reassessment to track maturity stage progression.

15 Case Patterns and Program Benchmarks

This article synthesizes recurring patterns observed across publicly available state integrated eligibility planning documents and human services interoperability research through early 2021, rather than reporting on a single named program.

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Pattern Observed	Reported Association
Shared master client index spanning SNAP and Medicaid	Fewer reported duplicate client records and faster cross program enrollment.
Cross program data governance council with LTSS representation	More consistent alignment of eligibility data definitions across programs.
Federated data sharing hub approach	Reduced need for full system consolidation while gaining interoperability benefits.
Documented cost allocation methodology established early	Fewer reported funding approval delays across federal authorities.
LTSS extension treated as an explicit, dedicated phase	Reduced likelihood of LTSS remaining permanently excluded from cross program data sharing.

15.1 Cross Program Observations

- **Observation 1:** States with a single, unified human services agency overseeing SNAP, Medicaid, and LTSS reported faster cross program governance formation than states with separate aging and disability services agencies.
- **Observation 2:** Medicaid MITA aligned modular procurement experience was frequently cited as a transferable asset when states later pursued SNAP or LTSS modernization.
- **Observation 3:** LTSS systems modernization efforts that began with an explicit interoperability requirement, rather than a purely program specific scope, reported smoother later stage integration with SNAP and Medicaid systems.

16 Key Performance Indicators for Ongoing Governance

Sustaining cross program interoperability gains requires an ongoing measurement framework spanning data quality, data sharing performance, and governance effectiveness across all three programs.

KPI	Definition	Illustrative Target
Duplicate client record rate	Percentage of individuals with unresolved duplicate records across SNAP, Medicaid, and LTSS systems.	Low and consistently decreasing over time.
Cross program enrollment timeliness	Average time from eligibility determination in one program to enrollment completion in a second eligible program.	Consistently short, trending shorter over time.
Verification data reuse rate	Percentage of verification data reused across programs rather than re-collected from the household.	High and consistently increasing.
Cross program governance meeting cadence adherence	Percentage of scheduled cross program governance meetings held as planned, with LTSS representation present.	Consistent adherence across all three programs.
Data sharing agreement compliance rate	Percentage of data exchanges conducted in full compliance with applicable data sharing agreements and privacy requirements.	Full compliance across all active data exchanges.
Cross program interoperability maturity score	Composite six dimension, three program maturity score tracked over time.	Steady progression toward higher maturity stages.

■ COMPLIANCE NOTE
KPIs should be reviewed by the cross program governance body on the monthly and quarterly cadence defined in Section 14.1, with particular attention to whether LTSS metrics are tracking consistently with SNAP and Medicaid metrics rather than lagging behind.

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17 Conclusion and Policy Recommendations

CCWIS aligned modularity and data sharing principles offer a useful design philosophy beyond child welfare, but applying them across SNAP, Medicaid, and LTSS requires deliberate translation given each program's distinct federal oversight structure, eligibility rules, and, in the case of LTSS, historically more siloed technology base.

17.1 Summary of Key Findings

- LTSS remains the most frequently excluded of the three programs from cross program data sharing and master client index efforts.
- SNAP and Medicaid data sharing is comparatively more mature, benefiting from more closely aligned eligibility processes and a longer history of integrated eligibility system investment.
- Cross program governance structures with parity LTSS representation, rather than bilateral SNAP and Medicaid coordination alone, are necessary to achieve full three program interoperability.
- Security and privacy architecture must be designed to the most stringent applicable requirement, generally HIPAA, wherever Medicaid data enters SNAP or LTSS systems.

17.2 Policy Recommendations

- **Recommendation 1:** States should conduct a formal six dimension, three program readiness assessment using the maturity matrix presented in Section 3.2 before committing to a specific interoperability architecture.
- **Recommendation 2:** LTSS extension should be treated as an explicit, resourced phase of any cross program interoperability roadmap, not an implicit later addition.
- **Recommendation 3:** Cross program governance bodies should be established with parity representation across SNAP, Medicaid, and LTSS program leadership from the outset.
- **Recommendation 4:** Federal program offices overseeing SNAP, Medicaid, and LTSS should continue coordinating guidance to reduce the administrative burden of navigating three distinct approval processes for shared infrastructure.

17.3 Closing Note

Agencies that extend CCWIS aligned modularity and data sharing principles deliberately and comprehensively across SNAP, Medicaid, and LTSS, rather than allowing interoperability efforts to stop at SNAP and Medicaid alone, are positioned to reduce administrative burden on households, improve eligibility accuracy, and accelerate access to the full range of benefits for which individuals and families qualify.

✦ References

1) U.S. Department of Health and Human Services, Administration for Children and Families. (2016). *Comprehensive child welfare information systems, final rule*, 81 Fed. Reg. 35450.
2) U.S. Department of Agriculture, Food and Nutrition Service. (2018). *SNAP advance planning document (APD) guidance and systems requirements*. FNS Handbook 901.
3) Centers for Medicare and Medicaid Services. (2012). *Medicaid Information Technology Architecture (MITA) 3.0 framework*. CMS Technical Guidance.
4) Centers for Medicare and Medicaid Services. (2018). *Medicaid enterprise systems: Seven conditions and standards*. CMS State Medicaid Director Guidance.
5) Administration for Community Living. (2016). *Older Americans Act reauthorization and LTSS systems modernization considerations*. ACL Program Guidance.
6) U.S. Department of Health and Human Services, Administration for Children and Families. (2013). *National Human Services Interoperability Architecture (NHSIA) framework*. ACF Technical Report.
7) U.S. Government Accountability Office. (2019). *Human services programs: Opportunities exist to improve data sharing and program coordination* (GAO-19-243).
8) American Public Human Services Association. (2019). *National Workgroup on Integration: Cross program data sharing practices*. APHSA Policy Brief.

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9) Urban Institute. (2019). *Integrated eligibility systems and cross program enrollment: A fifty state review*. Urban Institute Research Report.
10) Center for Digital Government. (2020). *Interoperability across health and human services programs*. Center for Digital Government Research Report.
11) National Association of State Chief Information Officers. (2019). *Integrated eligibility and interoperability in state human services IT*. NASCIO Research Brief.
12) National Association for Public Child Welfare Administrators. (2018). *Applying CCWIS principles beyond child welfare: Early state perspectives*. NAPCWA Issue Brief.
13) Office of the National Coordinator for Health Information Technology. (2019). *Federal Health IT Strategic Plan 2020 to 2025 (Draft)*. ONC Publication.
14) Kaiser Family Foundation. (2019). *Medicaid eligibility and enrollment systems modernization: State trends*. KFF Issue Brief.
15) Chapin Hall at the University of Chicago. (2019). *Data governance across human services programs: Lessons from child welfare for broader application*. Chapin Hall Research Brief.
16) Government Technology. (2020). *States explore cross program data sharing between benefits and long term care systems*. e.Republic Government Technology Publication.
17) AARP Public Policy Institute. (2018). *Long term services and supports systems modernization: State approaches*. AARP Public Policy Institute Report.
18) Health Level Seven International. (2019). *Fast Healthcare Interoperability Resources (FHIR), Release 4*. HL7 Standard Specification.

