Program Dependency Diagram
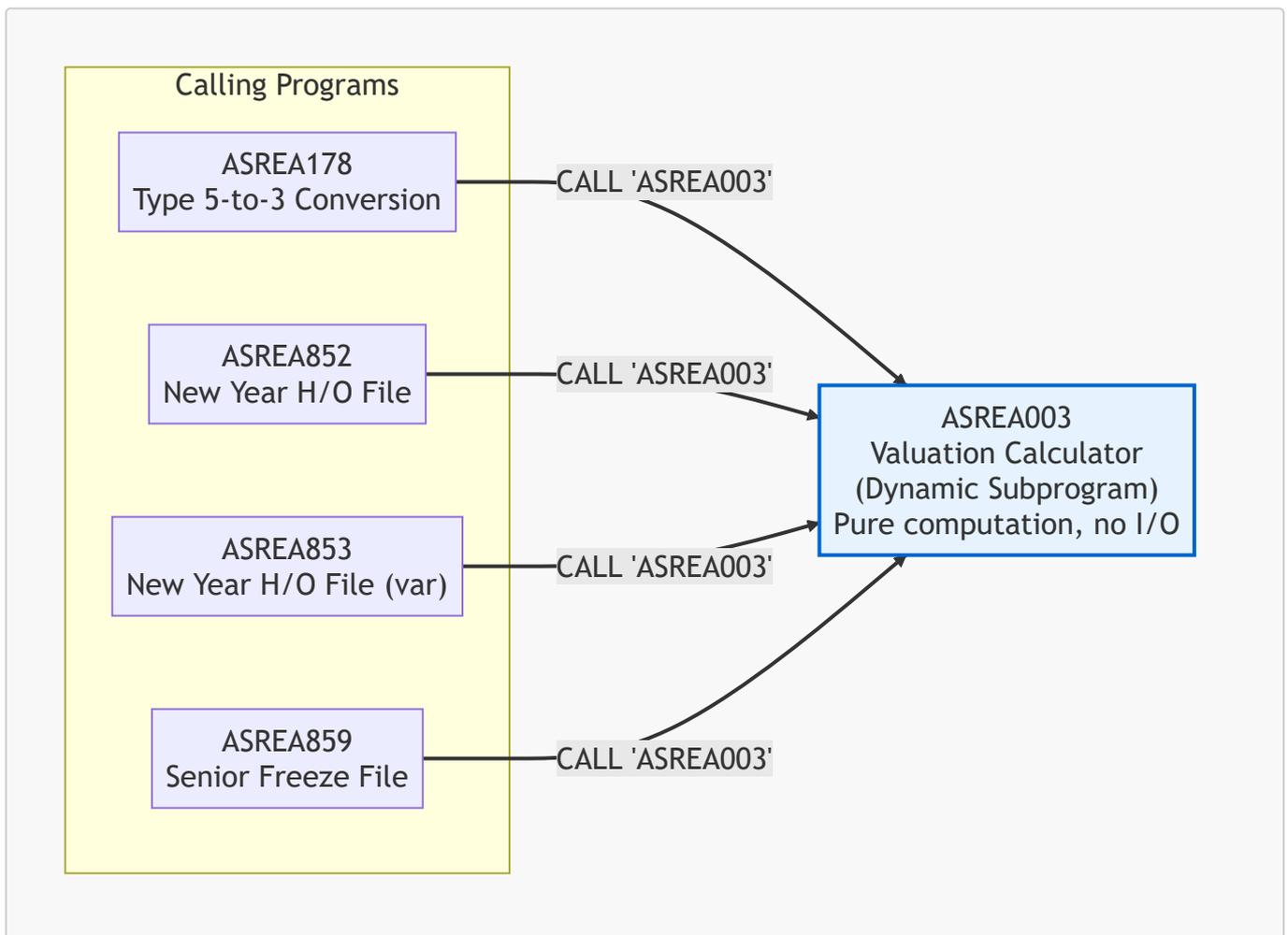
Task 1.5 Deliverable -- Software Architecture Diagrams

This document maps which programs call, feed data to, or otherwise depend on other programs in the Cook County Tax Extension system. Dependencies are established through two mechanisms:

1. **Direct CALL** -- One program issues a `CALL 'programname'` to invoke a subprogram.
2. **File-mediated dependency** -- One program's output file is consumed as input by a subsequent program (identified by matching DD names across programs).

1. Direct Subprogram Call Dependencies

Only one dynamic subprogram exists in the system: **ASREA003**, the Y2K-fixed valuation calculator. Its predecessor **ASREA002** is superseded and not called by any current program.

ASREA003 receives a detail record via `PROCEDURE DIVISION USING D1-REC` and returns computed valuation results via `GOBACK`. It must be compiled as a shared library (.dll on Windows, .so on Linux, .dylib on macOS) before any calling program can execute.

2. File-Mediated Dependencies -- Full Pipeline View

The following diagram shows the major program-to-program data flow chains. An arrow from Program A to Program B means that one or more of A's output files serve as input to B. This is the primary coupling mechanism in this batch-oriented system.

3. Dependency Summary by Phase

Phase 1 to Phase 2 Handoffs

Upstream	Downstream	Shared File / DD Name
ASHMA921/922/923	ASREA005 and subsequent master processing	Sequential extract files (UT-S-OUTFILE)
ASCOE500	ASCOE515	UT-S-ASCOEWRK (COE Workfile)

Phase 2 Internal Dependencies (Assessment Master Chain)

The Assessment Master is processed by a serial chain where each program reads MASTIN and writes MASTOUT (or equivalent), creating generations of the file:

Step	Program	Reads	Writes
1	ASREA005	UT-S-INFILE	UT-S-OUTFILE
2	ASREA010	UT-S-MASTER	UT-S-PRNTFILE
3	ASREA018	UT-S-MASTIN	UT-S-MASTOUT
4	ASREA105	UT-S-MASTIN	UT-S-MASTOUT

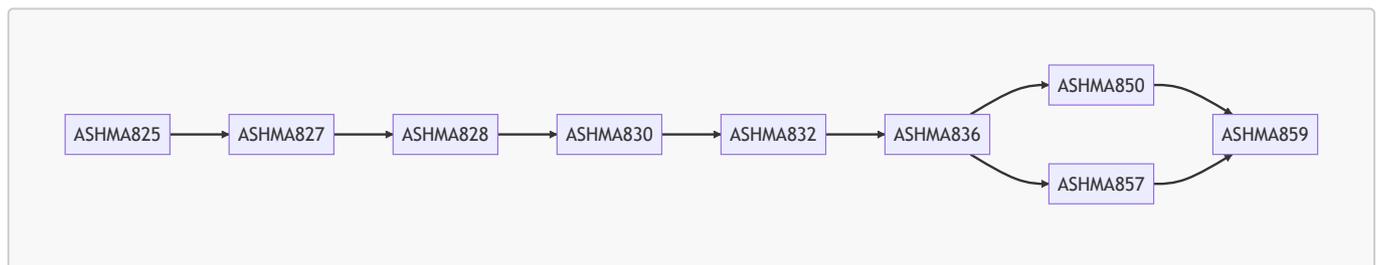| Step	Program	Reads	Writes
5	ASREA151	UT-S-MASTERIN	UT-S-MASTROUT
6	ASREA352	UT-S-MSTRIN	UT-S-MSTROUT
7	ASHMA831	UT-S-MSTRIN	UT-S-MSTROUT
8	ASHMA550	UT-S-MASTIN	UT-S-MASTOUT
9	ASSRQ560/561	UT-S-MASTIN	UT-S-MASTOUT
10	CLRTM356	UT-S-ASSESMST	UT-S-ASSESOUT

Phase 2 to Phase 3 Handoffs

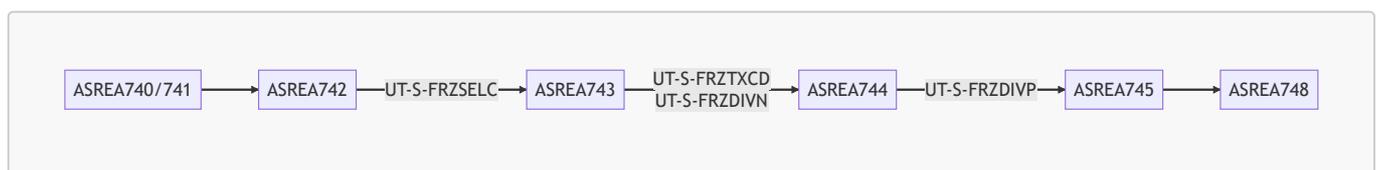| Upstream	Downstream	Shared File / DD Name
ASCOE515	ASHMA855	UT-S-ASCOEPRW (COE Print Report Workfile)
Assessment Master (ASHMA550 output)	ASREA852/853/859	UT-S-MASTER (Assessment Master)
ASHMA440	ASHMA550	UT-S-HOMESTD (Homestead sequential)

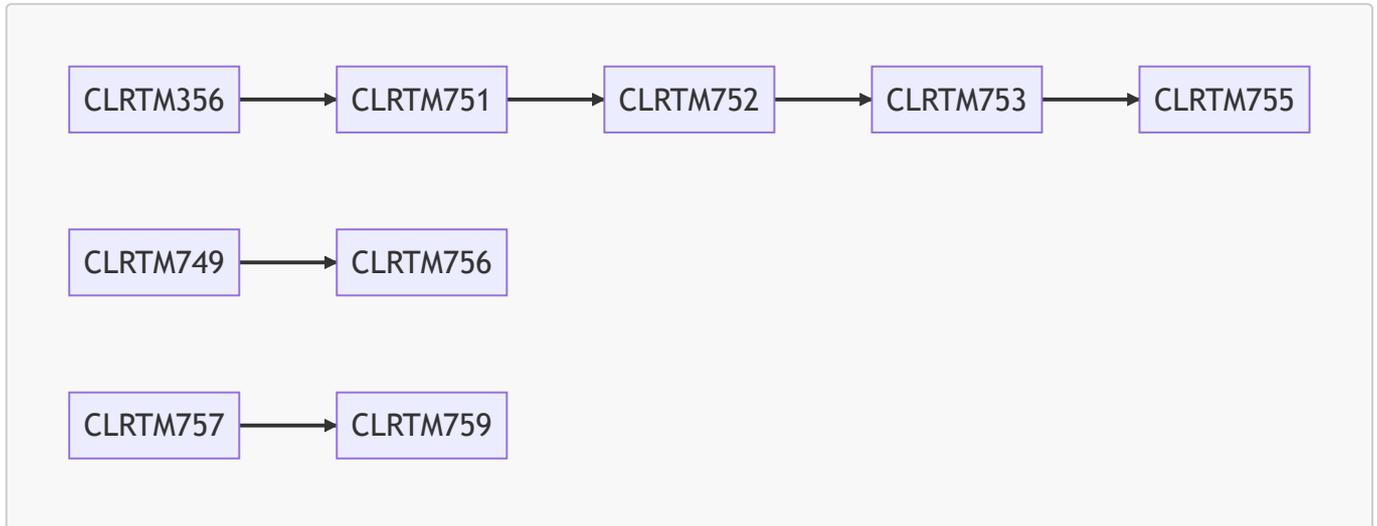## Phase 3 to Phase 4 Handoffs

Upstream	Downstream	Shared File / DD Name
ASREA859	ASHMA825	Senior Freeze file
ASHMA839 output	ASHMA836	UT-S-HOMEXMPT (Homeowner Exemption)

Phase 4 Internal Dependencies (Senior Freeze Pipeline)

ASHMA825 → ASHMA827 → ASHMA828 → ASHMA830 → ASHMA832 → ASHMA836 → ASHMA850 → ASHMA859; ASHMA836 → ASHMA857 → ASHMA859

Phase 5 Internal Dependencies (Frozen Valuation Pipeline)

ASREA740/741 → ASREA742 —UT-S-FRZSELC→ ASREA743 —UT-S-FRZTXCD / UT-S-FRZDIVN→ ASREA744 —UT-S-FRZDIVP→ ASREA745 → ASREA748

Phase 5 to Phase 6 Handoffs

Upstream	Downstream	Shared File / DD Name

Upstream	Downstream	Shared File / DD Name
ASREA748	CLRTM749/750	UT-S-FRZAGCY / UT-S-FRZAGIN (Frozen Agency)
Assessment Master (post-TIF)	CLRTM752	UT-S-MASTERIN

Phase 6 Internal Dependencies (Tax Rate Making Pipeline)

4. Variant and Near-Duplicate Programs

Several programs are near-duplicates that serve the same functional role under different conditions. These represent alternative paths rather than sequential dependencies:

Variant Group	Programs	Selection Criterion
IMS Extract	ASHMA921, ASHMA922, ASHMA923	Different filter/format; typically one runs per job
Frozen Valuation	ASREA740, ASREA741	Quad townships vs. non-quad townships
New Year H/O File	ASREA852, ASREA853, ASREA859	Different file generation or exemption type
Circulator	ASSRQ560, ASSRQ561	Different service request processing variants
SF Base Value	ASHMA850, ASHMA857	IMS output vs. sequential file output

5. Programs with No Upstream or Downstream File Dependencies

These programs operate independently or serve utility/test roles:

Program	Role	Notes
ASREA001	Test harness	No file I/O; not production
ASREA002	Superseded subprogram	Replaced by ASREA003

Program	Role	Notes
ASREA007	IMS record deletion	Cleanup utility; no sequential file output
CLREB020	EQ factor editing	Reads input cards, writes factor file consumed by ASHMA850/855/857
ASREA856	Township H/O files	Reads homeowner master, creates township subset files
ASREA868	Missing valuation report	Report-only; no downstream file consumers
ASREA872	Town response report	Report-only; no downstream file consumers
ASREA874	Disabled exemption file	Creates disability exemption file; limited downstream usage

6. Key Observations for Modernization

1. **The Assessment Master is the most heavily chained file.** At least 10 programs read and write it sequentially, forming a strict pipeline where each program must run after the previous one completes. In a modernized system, these could potentially be collapsed into fewer steps or run against a shared database.

2. **The Senior Freeze pipeline (ASHMA825 through ASHMA859) is the longest single chain** -- 8 programs in strict sequence. This represents the highest scheduling risk if any step fails.

3. **The Frozen Valuation sub-pipeline (ASREA742-748) is tightly coupled** through a sequence of five programs producing intermediate files. These programs share copybook structures and could be consolidated.

4. **ASREA003 is the only code-level dependency** (dynamic CALL). All other inter-program dependencies are mediated through sequential files, making them loosely coupled at the code level but tightly coupled at the operational level.

5. **Near-duplicate programs** (ASHMA921/922/923, ASREA740/741, ASREA852/853, ASSRQ560/561) are consolidation candidates. Each pair shares the same dependency position in the pipeline.