VLASS Portal Marketing Visuals

VLASS Portal: Visual Summary & Infographics Reference

VLASS Portal: Visual Summary & Infographics Reference

Document Purpose

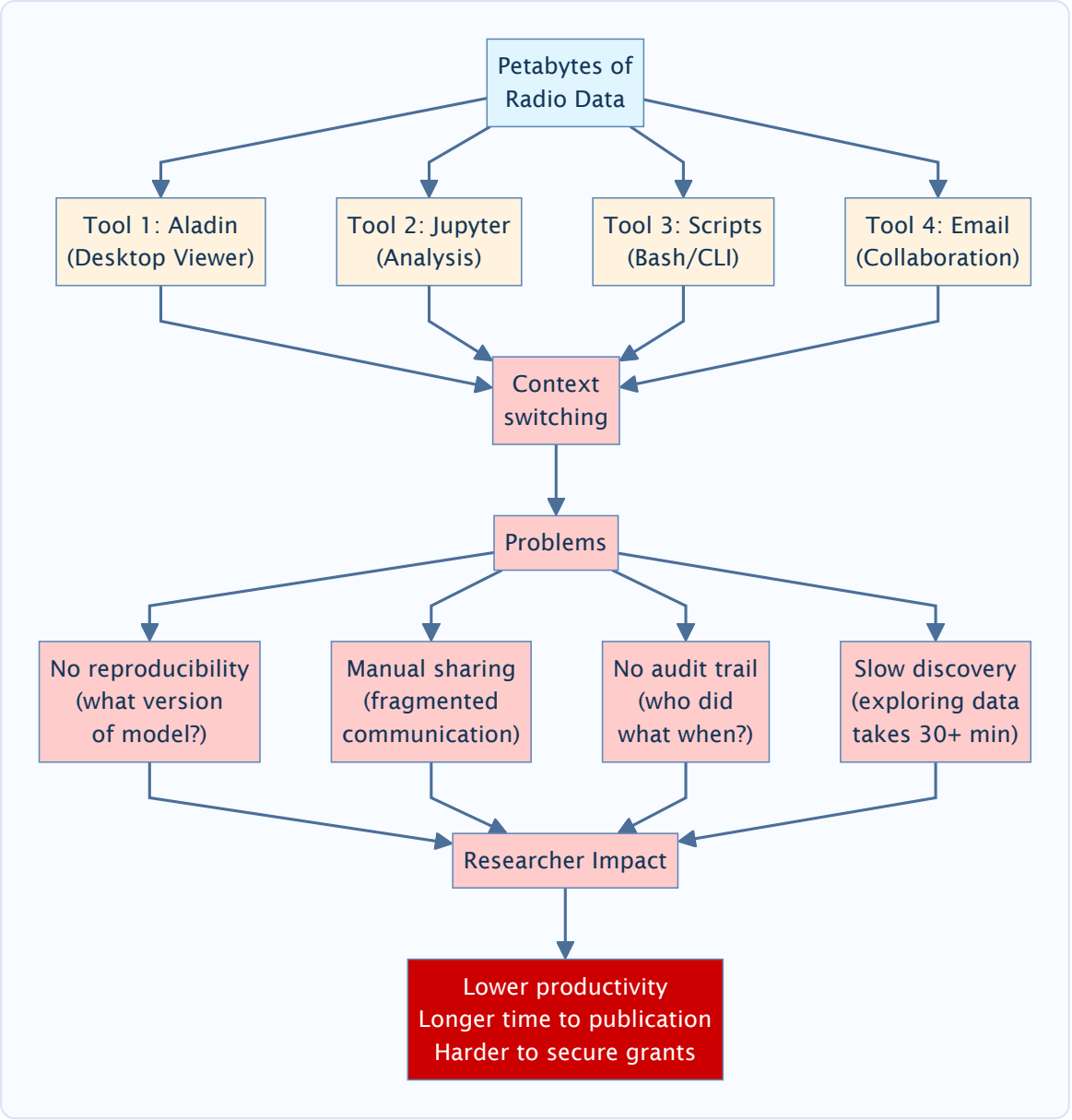
This document provides **detailed specifications and Mermaid diagrams** for creating professional marketing visuals and infographics for VLASS Portal. It complements the main marketing overview and is suitable for conversion to PDF or graphic design workflows.

---

1. Problem Statement Visualization

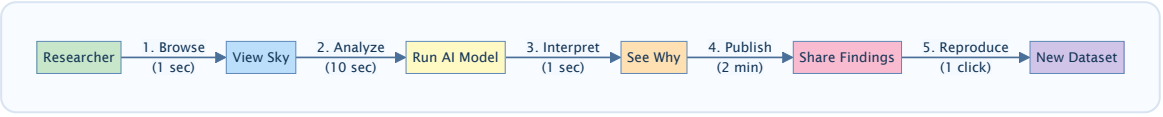
The Fragmentation Problem

The current radio astronomy workflow is scattered across incompatible tools:



The Opportunity

What researchers *could* do with unified platform:

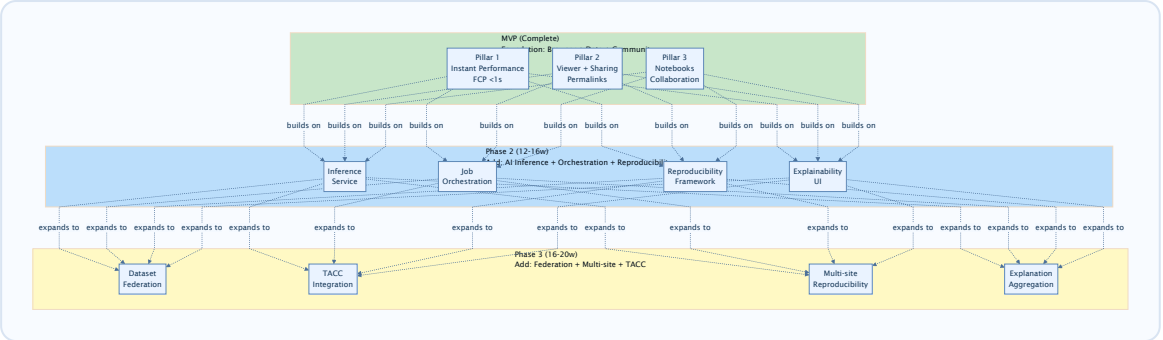


Estimated end-to-end time: approximately 3 minutes from data to publication.

---

2. Capability Pyramid: MVP → Phase 2 → Phase 3

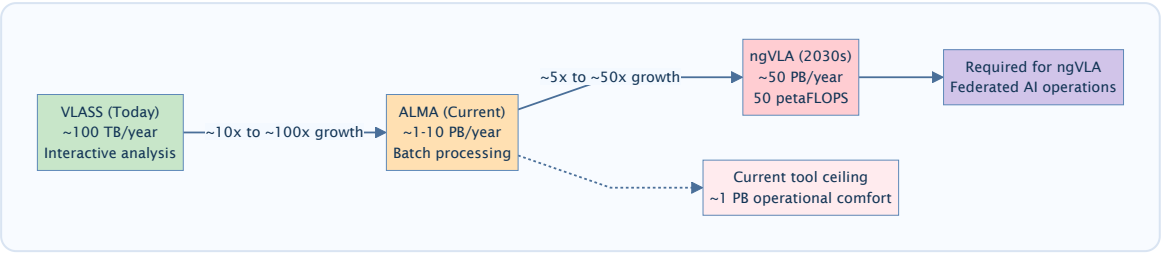
The progression of vlass-portal from static viewer to federated national infrastructure:



---

3. Data Volume Challenge: Why This Matters

Comparing radio astronomy data scales across facilities:



Facility	Annual Data Volume	Analysis Mode	Operational Implication
VLASS (Today)	~100 TB	Interactive (<30s)	Desktop/notebook workflows are still workable
ALMA (Current)	~1-10 PB	Batch (hours)	Requires shared institutional infrastructure
ngVLA (2030s)	~50 PB	Real-time + distributed	Demands federated orchestration and high-scale AI operations

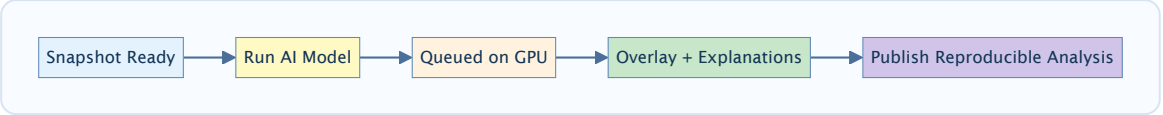
---

4. User Journey: From Discovery to Publication

Journey Through MVP (What Exists Today)

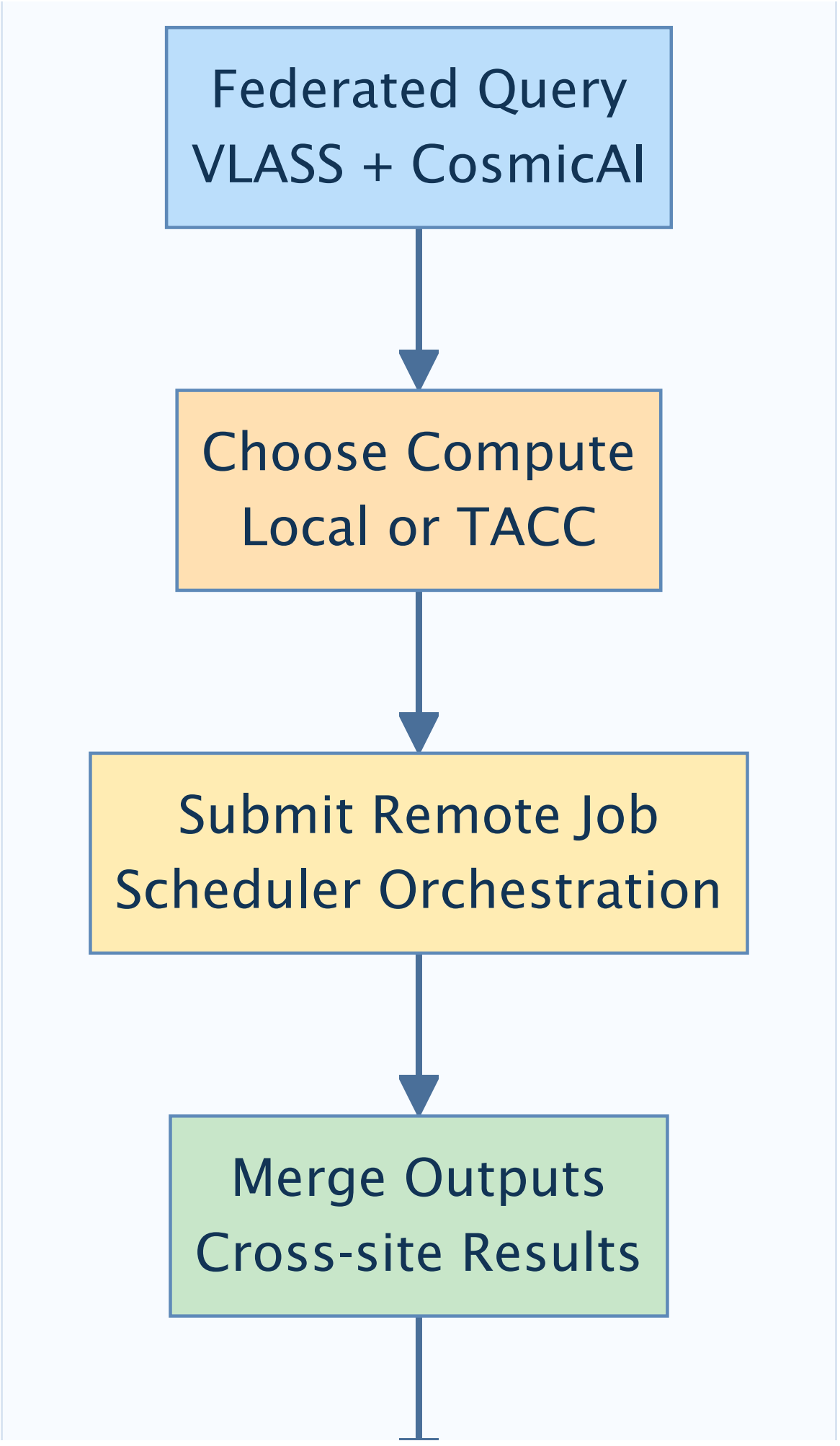
Step	Action	Typical Time
1	Land on SSR page (mobile/desktop)	0s
2	Viewer loads preview	~20s
3	Explore target sky region	~1 min
4	Capture snapshot and share link	~1.5 min
5	Publish post with embedded context	~2 min

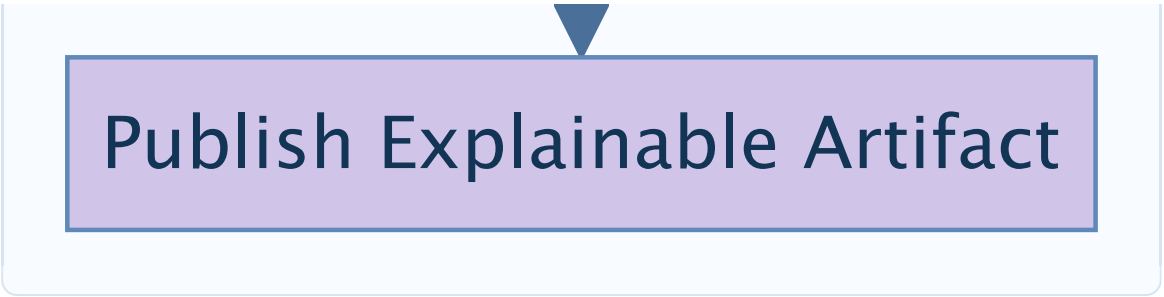
Extended Journey Through Phase 2 (AI Analysis)



Step	Action	Typical Time
6	Select model and click Analyze	~10s
7	Job queued/executed on GPU	~20s
8	Overlay + explainability returned	~30s
9	Publish reproducible AI-assisted analysis	~30-60s

Full Journey Through Phase 3 (Multi-Site Federation)


Federated Query
VLASS + CosmicAI
Choose Compute
Local or TACC
Submit Remote Job
Scheduler Orchestration
Merge Outputs
Cross-site Results



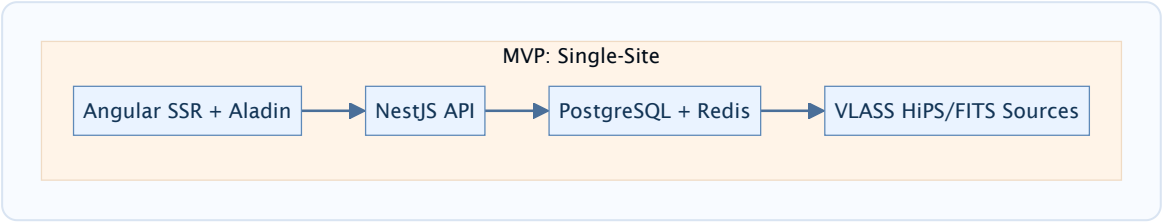
Multi-site flow summary

1. Select federated datasets (`VLASS + CosmicAI`) with sub-2s query time.
2. Choose compute path (local GPU for fast runs, TACC for large jobs).
3. Submit federated job (staging + scheduler + live status + cache checks).
4. Compare multi-model outputs and expert review for confidence scoring.
5. Publish reproducible artifact (data versions, model versions, params, outputs, DOI).

---

5. Architecture Evolution

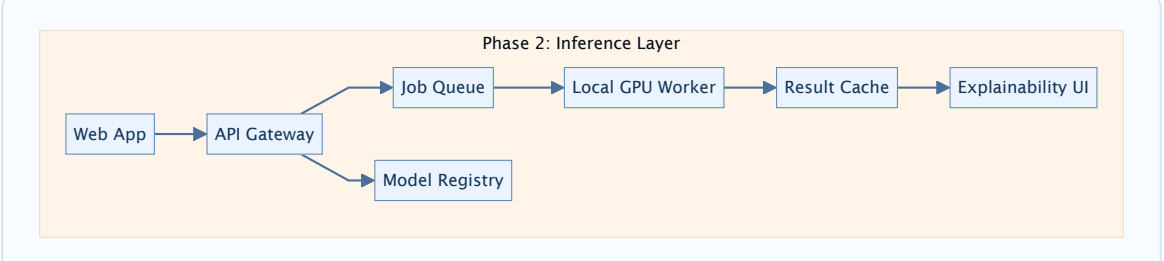
MVP Architecture (Simple, Single-Site)



MVP profile

- Complexity: Low
- Deployment: Docker Compose
- Scalability: Single server

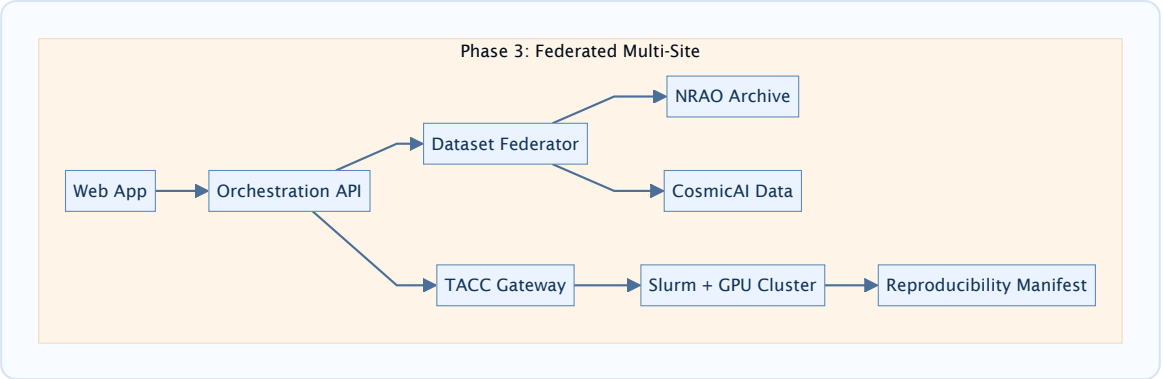
Phase 2 Architecture (Local AI + Inference)



Phase 2 profile

- Complexity: Medium
- Deployment: Kubernetes-ready
- Scalability: Single GPU node

Phase 3 Architecture (Federated Multi-Site)

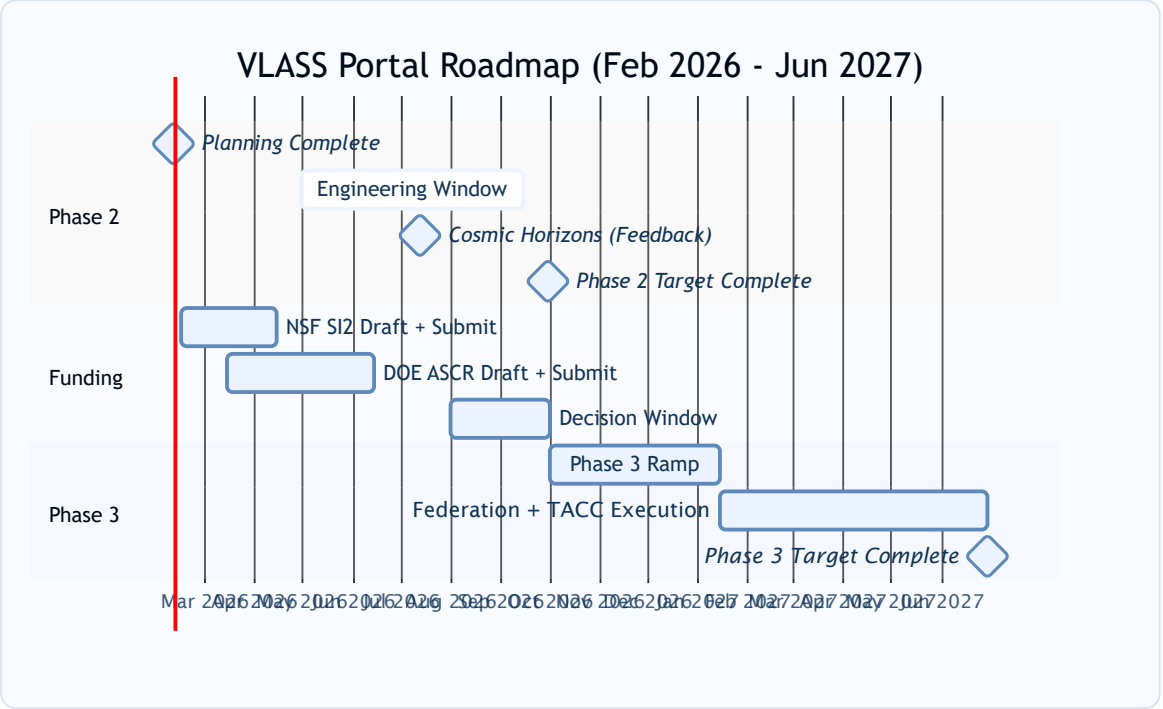


Phase 3 profile

- Complexity: High
- Deployment: Kubernetes + Helm
- Scalability: Multi-region, petaflop-scale

---

6. Timeline: Gantt-Style Roadmap

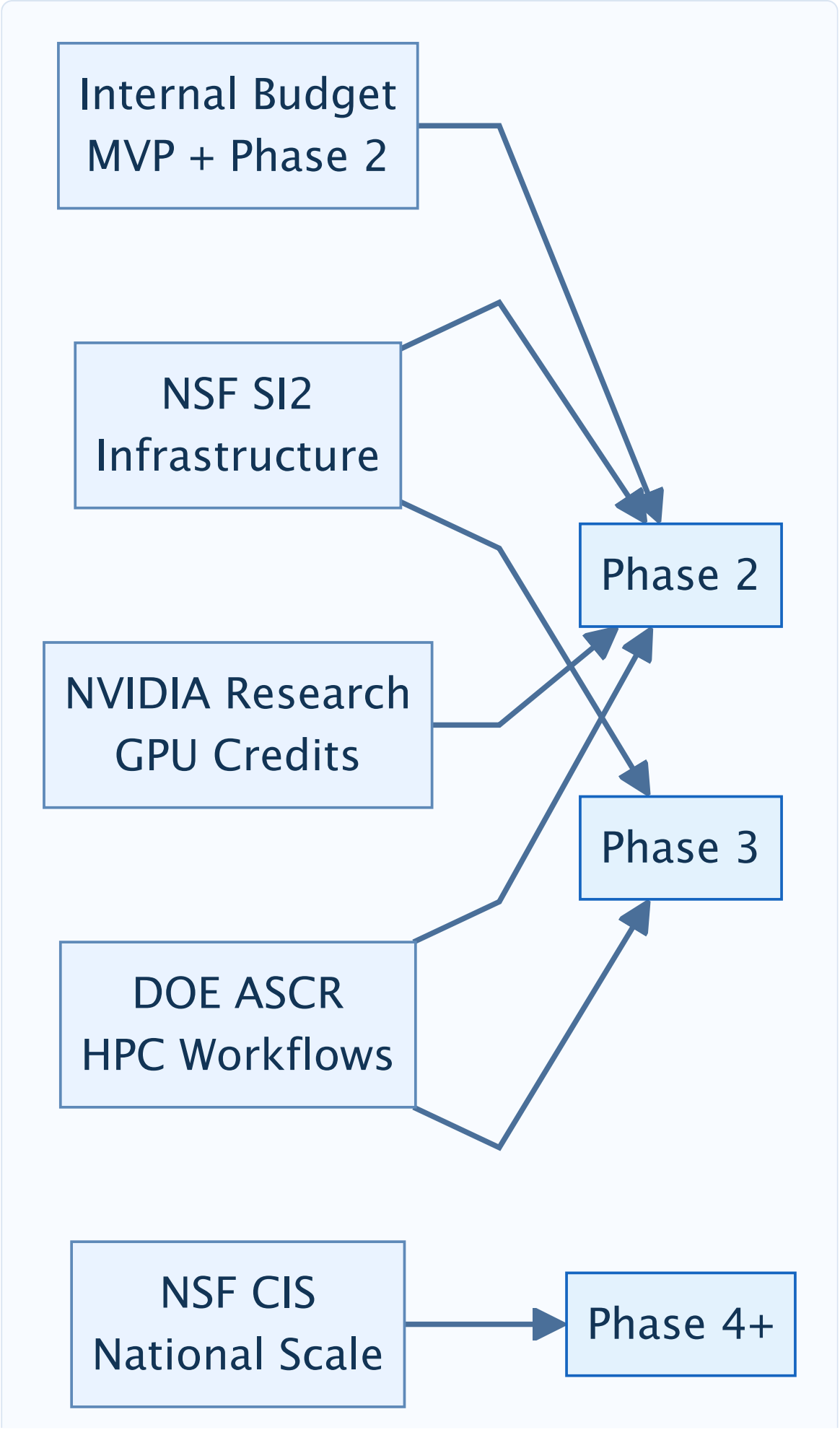


Window	Milestones
Feb-Apr 2026	Phase 2 planning complete, NSF/DOE/NVIDIA prep
May-Sep 2026	Phase 2 engineering execution and integration
Jul 2026	Cosmic Horizons feedback milestone
Aug-Oct 2026	Funding decision window
Oct 2026-Jun 2027	Phase 3 federation + TACC execution
Jun 2027	Phase 3 target completion and pilot readiness

---

7. Funding Landscape

Who Funds What

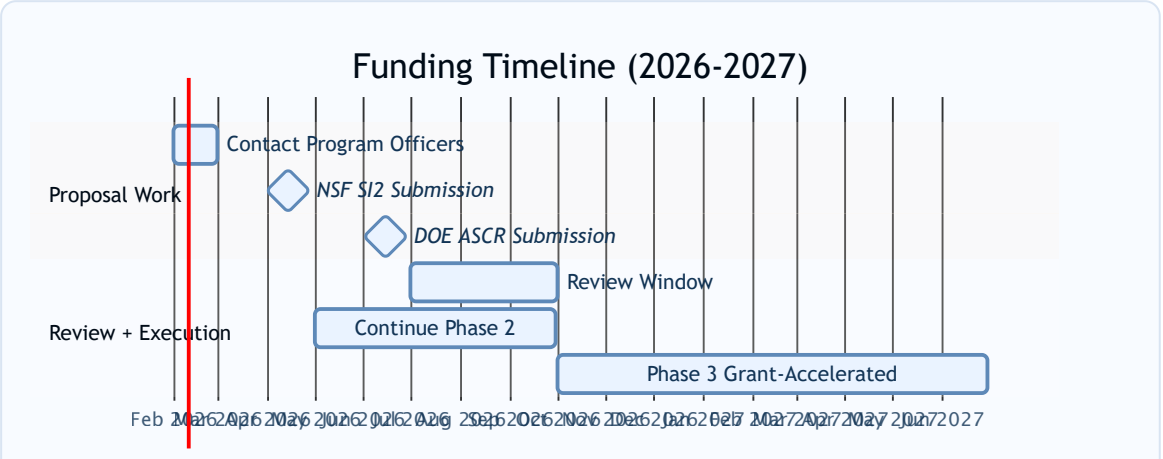

Internal Budget
MVP + Phase 2
NSF SI2
Infrastructure
NVIDIA Research
GPU Credits
DOE ASCR
HPC Workflows
NSF CIS
National Scale
Phase 2
Phase 3
Phase 4+

Funding Source	Primary Phase Coverage	Budget Range	Notes
Internal budget (dept/R&D)	MVP + Phase 2	~$150K	Self-funded bridge
NSF SI2 (software infrastructure)	Phase 2-3	150*K*–300K	24 months, ~20-25% success
DOE ASCR (advanced computing)	Phase 2-3	200*K*–400K	24 months, ~25-30% success
NVIDIA research support	Phase 2	50*K*–150K	Credits/hardware, ~60-70% success
NSF CIS (later-stage infra)	Phase 4+	500*K*–1M+	36+ months, ~15-20% success

Realistic blended range

`$800K-$1.6M` over staged cycles.

Funding Timeline

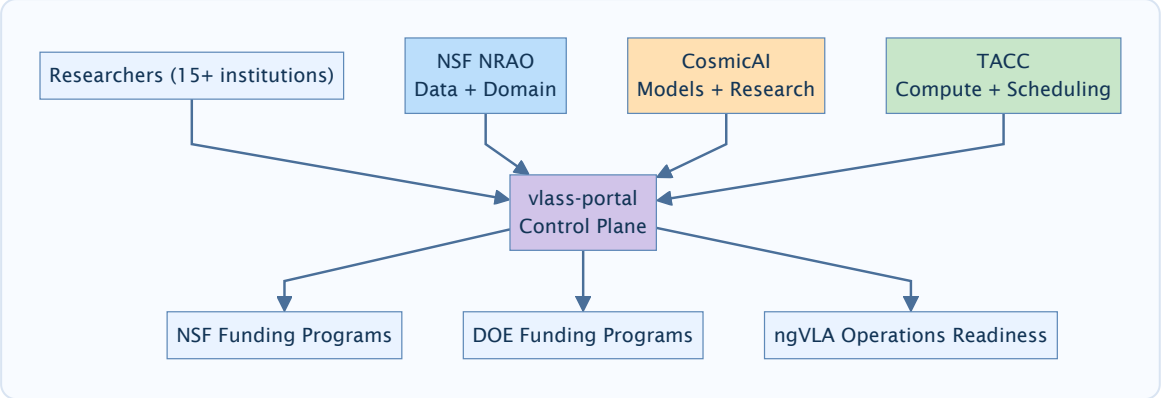


Period	Action
Feb-Mar 2026	Finalize planning and contact program officers
Apr-Jun 2026	Submit NSF SI2 and DOE ASCR proposals
Jul-Oct 2026	Continue Phase 2 while decisions are pending
Oct 2026-Jun 2027	Phase 3 ramp/execution (grant-accelerated if funded)
Jun-Aug 2027	NSF CIS fallback planning if needed

---

8. Strategic Partnership Map

Showing how VLASS Portal connects multiple stakeholders:



Layer	Stakeholders	Relationship to vlass-portal
Community	Researchers (15+ institutions)	Drive use-cases and validation feedback
Core partners	NSF NRAO, CosmicAI, TACC	Provide data, models, and compute pathways
Strategic outcomes	NSF, DOE, ngVLA ecosystem	Funding leverage and long-horizon operational alignment

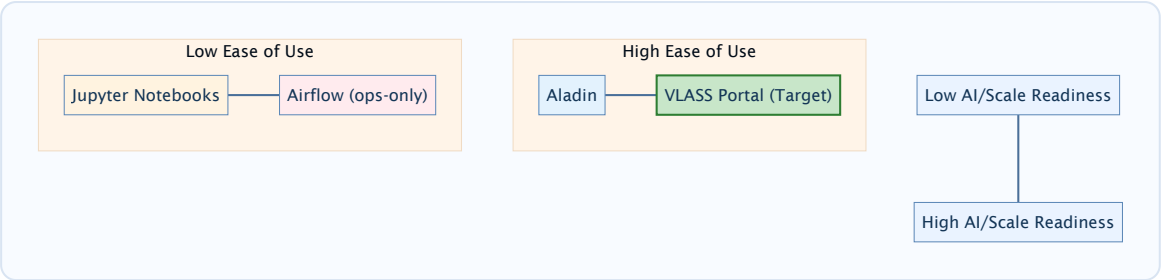
Timeline summary:

- 2026: Integrate data + model + compute workflows.
- 2027: Multi-institution pilot operations.
- 2030+: ngVLA-aligned operations readiness.

---

9. Comparative Technology Positioning

Market Positioning Matrix



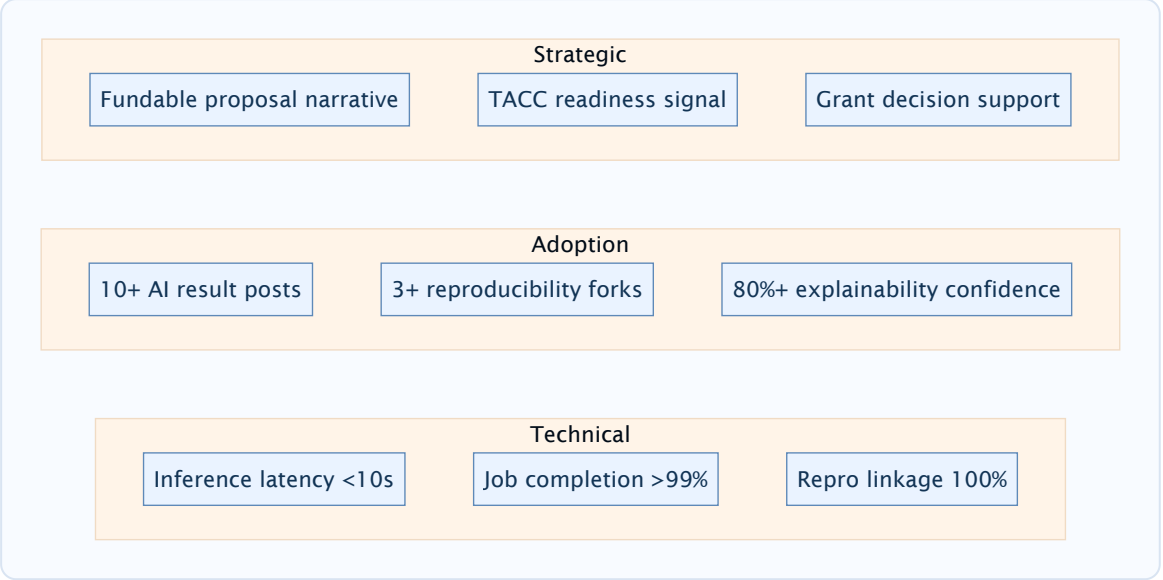
Positioning summary

`vlass-portal` is positioned in the high-ease/high-scale quadrant compared with single-purpose tools.

---

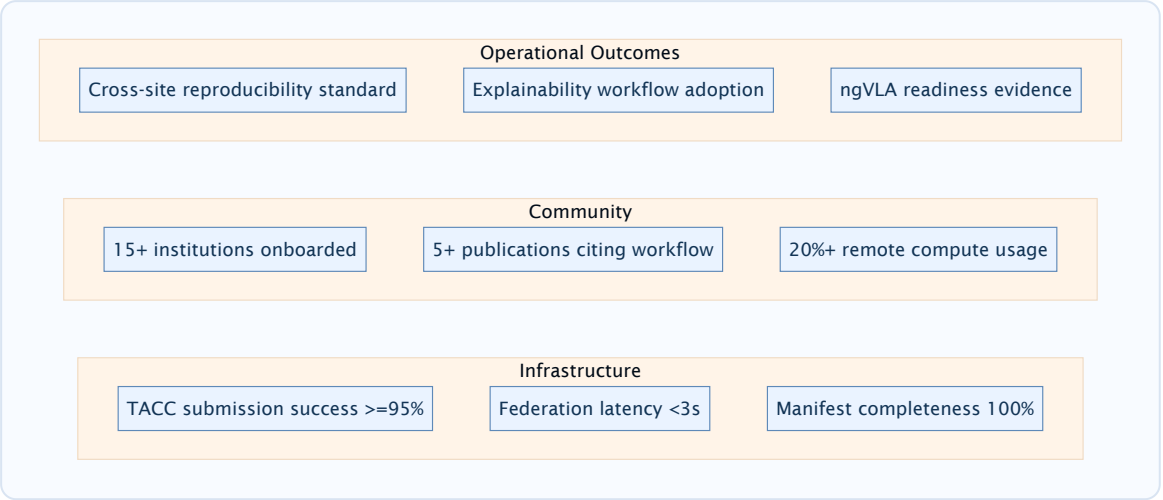
10. Success Metrics Dashboard

Phase 2 Success Metrics (Target Sep 2026)



Category	Metric	Target	Current
Technical	Inference latency	<10s	Test pending
Technical	Job completion rate	>99%	Test pending
Technical	Reproducibility linkage	100%	Test pending
Adoption	Posts with AI results	10+	5
Adoption	Users running forks	3+	1
Adoption	Explainability satisfaction	>80%	75%
Strategic	Fundable proposal narrative	Yes	Done
Strategic	TACC partnership readiness	Yes	In plan
Strategic	Grant decision support	Yes	TBD

Phase 3 Success Metrics (Target Jun 2027)



Category	Metric	Target	Current
Infrastructure	TACC submission success	>=95%	Test pending
Infrastructure	Federation latency	<3s	Test pending
Infrastructure	Reproducibility completeness	100%	Test pending
Community	Institutions onboarded	15+	0
Community	Peer-reviewed citations	5+	0
Community	TACC-compute posts	>=20%	0%
Strategic	NSF/DOE grant awarded	Yes	TBD
Strategic	CosmicAI formal endpoints	Yes	Planned
Strategic	ngVLA planning integration	Yes	Planned

---

11. Infographics Call-Out Locations

In the primary MARKETING-OVERVIEW.md document, these sections should include professional graphics:

Section	Visual Type	Recommendation
Executive Summary	Single-page summary	Ensure all key metrics visible
The Problem	Fragmentation diagram	Show tool incompatibility + pain points
The Solution	Capability pyramid	MVP → Phase 2 → Phase 3 progression
MVP Features	Feature tiles + storyboard	4-5 panel workflow showing speed
Phase 2 Pillars	4-quadrant feature matrix	Inference, orchestration, reproducibility, explainability
Phase 3 Pillars	Multi-site architecture	Federation, TACC, reproducibility at scale
Technical Architecture	Layered system diagram (3 versions)	Show evolution from MVP through Phase 3
Strategic Alignment	Partnership network map	NRAO, CosmicAI, TACC, ngVLA connections
Timeline	Gantt/waterfall chart	Feb 2026 → Jun 2027 with milestones
Funding	Waterfall + success probability	Budget allocation, grant pathways
Competitive Positioning	Matrix charts	VLASS Portal vs. Aladin, Jupyter, Airflow

---

12. Design Specifications

Color Palette (NSF-Aligned)

```
Primary Blue (NSF brand):     #003f87
Secondary Orange (CosmicAI):  #ff6b35
Accent Green (Results):       #06a77d
Warning Red (Problems):       #d62246
Success Green (Complete):     #0a8f4f

Neutral Gray (backgrounds):   #f5f5f5
Text Dark:                    #333333
Text Light:                   #666666
```

Typography

- **Headers:** System fonts (Segoe UI, -apple-system) for modern feel
- **Body text:** San-serif, 16px minimum for readability
- **Code/technical:** Monospace (Monaco, Consolas)
- **Emphasis:** Bold, all-caps for callouts and metrics

Icon System

- **Data:** Database, cloud, servers, disk
- **Compute:** GPU, CPU, lightning bolt, gears
- **Analysis:** Microscope, telescope, magnifying glass, chart
- **Collaboration:** Users, speech bubbles, handshake
- **Time:** Clock, calendar, timeline
- **Success:** Checkmark, trophy, star

---

13. PDF Export Recommendations

Best Practices for Conversion

1. **Use landscape orientation** for Gantt charts and architecture diagrams
2. **Embed high-resolution Mermaid diagrams** (300+ DPI if rasterized)
3. **Include table of contents** with internal links (for digital PDFs)
4. **Add page numbers** and section headers (for printing)
5. **Specify margins:** 1" top/bottom, 0.75" left/right
6. **Font embedding:** Ensure all custom fonts are embedded
7. **Color mode:** RGB for screen, CMYK for print

Suggested Tools

- **Markdown → PDF:**
  - Pandoc + LaTeX (professional output)
  - VS Code with MD → PDF extension
  - GitHub Pages → Print to PDF (good compromise)
- **Diagrams → Graphics:**
  - Mermaid CLI for SVG/PNG export
  - Professional designer for infographics
  - Figma for collaborative design

---

14. Print-Ready Checklist

- ✅ All diagrams have legends
- ✅ Color scheme is print-friendly (accessible with B&W printing)
- ✅ Text is legible at 50% scale (test on printed page)
- ✅ URLs are hyperlinked in digital PDF
- ✅ Diagrams are labeled with figure numbers
- ✅ Sources/citations included for graphics
- ✅ Appendices linked from TOC
- ✅ No page breaks in middle of content
- ✅ Consistent header/footer branding
- ✅ Meets 508 accessibility standards (alt text for images)

End of Visual Summary Document