REGIONAL TRANSPORTATION PLANNING OFFICE
Grand Valley MPO • Grand Valley TPR • Grand Valley Transit

MESA COUNTY



Infrastructure & Utility Planning Portal

Grand Valley MPO Inter-Agency Collaboration

Fragmented Planning & Communication Gaps Lead to Overlapping Projects and ROW Conflicts

Inter-agency communication gaps and fragmented capital improvement project planning create significant challenges for regional development.

A lack of utility coordination frequently leads to overlapping projects and Right-Of-Way (ROW) conflicts, Which then lead to waste of materials, labor, and taxpayer dollars.

By addressing these fragmented workflows, we can eliminate redundant efforts and prevent costly spatial conflicts before they occur in the field.

01 2020 2” Mill and Overlay

02 Cost to Taxpayer ~$70K (materials only)

03 2022 Bridge Demo

04 2023 Repaved



The Current State of Communication

- Breaking down silos
  - Inter-agency and external
- Long-term maintenance planning
- Use current conflicts to improve future planning
- Going old school with clear communication
  - Cold calls
  - A message sent is not a message received
  - Not automated- room for error
- Lack of organization and collaborative record keeping



A Shared Digital GIS Platform

Unifying Regional Capital Improvement and Utility Coordination

To resolve regional planning conflicts, a custom solution was developed to be a shared digital GIS planning platform.

This unified space is designed specifically for regional capital improvement and utility coordination across Mesa County and Grand Valley MPO partner jurisdictions, alongside private utility companies.

By centralizing our spatial data, multiple agencies can collaborate within a single environment, ensuring that all stakeholders have real-time visibility into upcoming infrastructure projects.

Spatial Mapping & Synergy Screening

Interactive tools enable spatial project mapping and multi-agency synergy screening.

01

Interactive Mapping Tools

Features multi-geometry drawing tools for precise interactive spatial project mapping across regions.

02

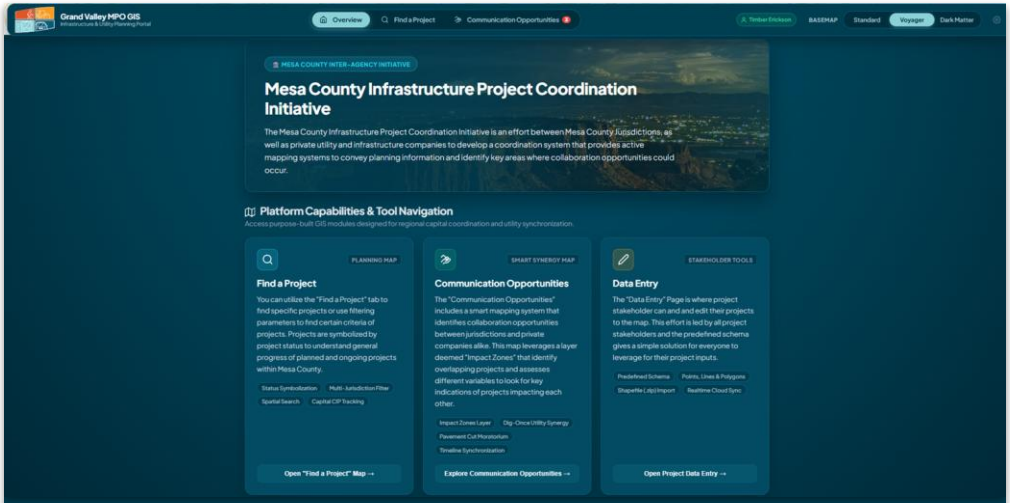
ROW Impact Analysis

Calculates Right-Of-Way (ROW) impact zones to proactively flag overlapping project footprints.

03

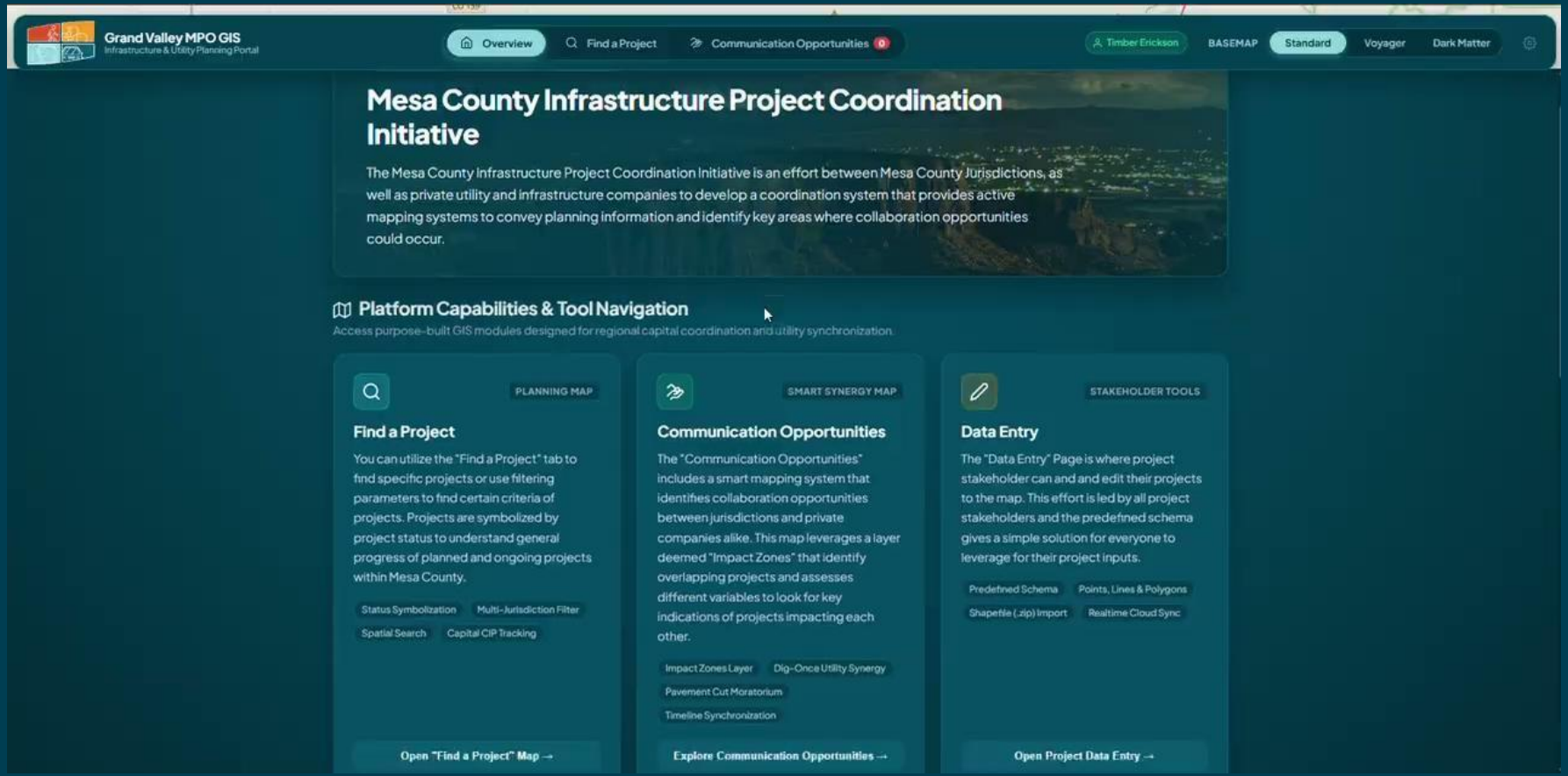
Synergy Screening

Uncovers joint project opportunities, allowing jurisdictions to coordinate efforts and share resources.

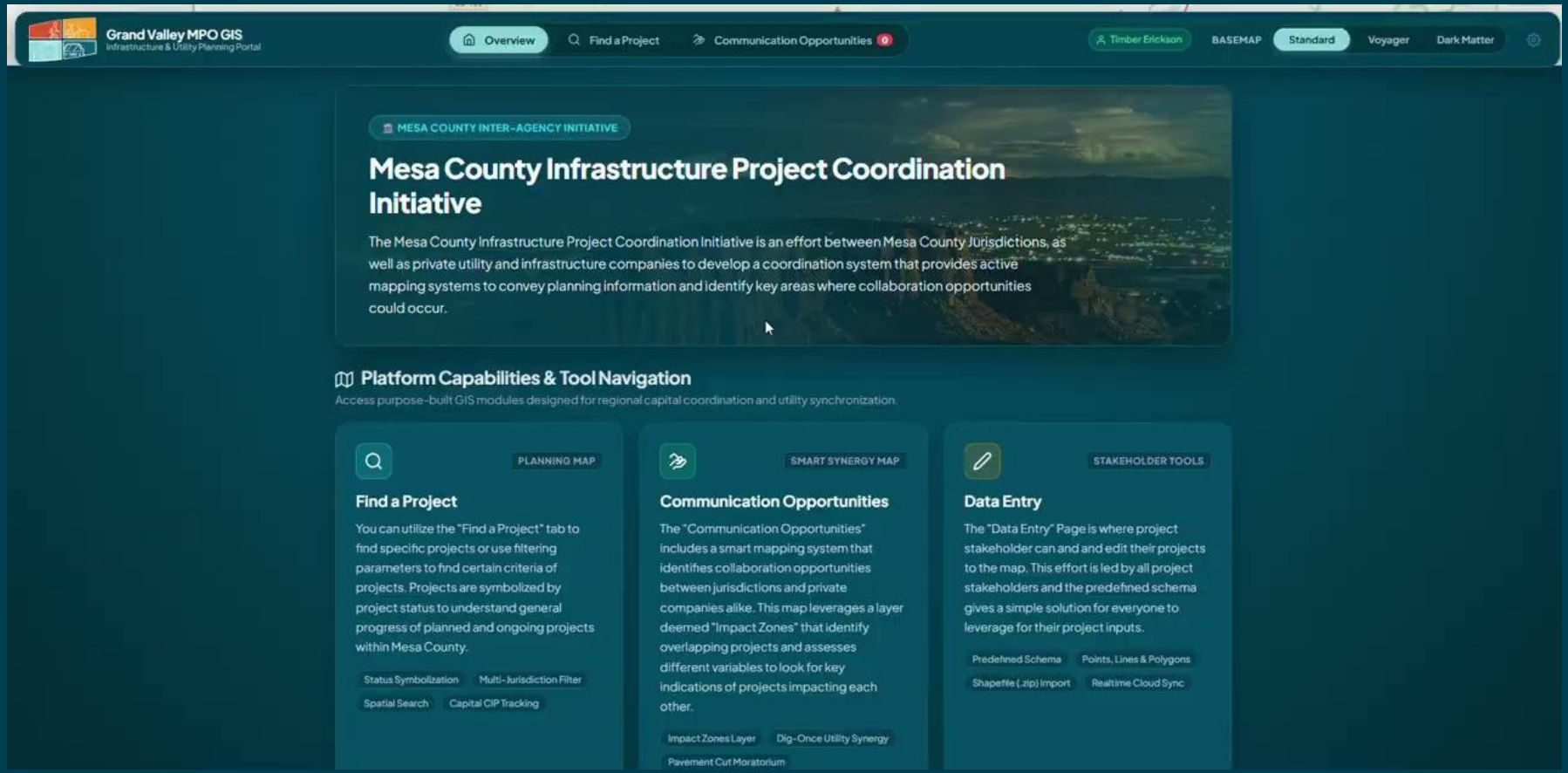


Interactive Portal Demo — Geoportal Synergy Analytics

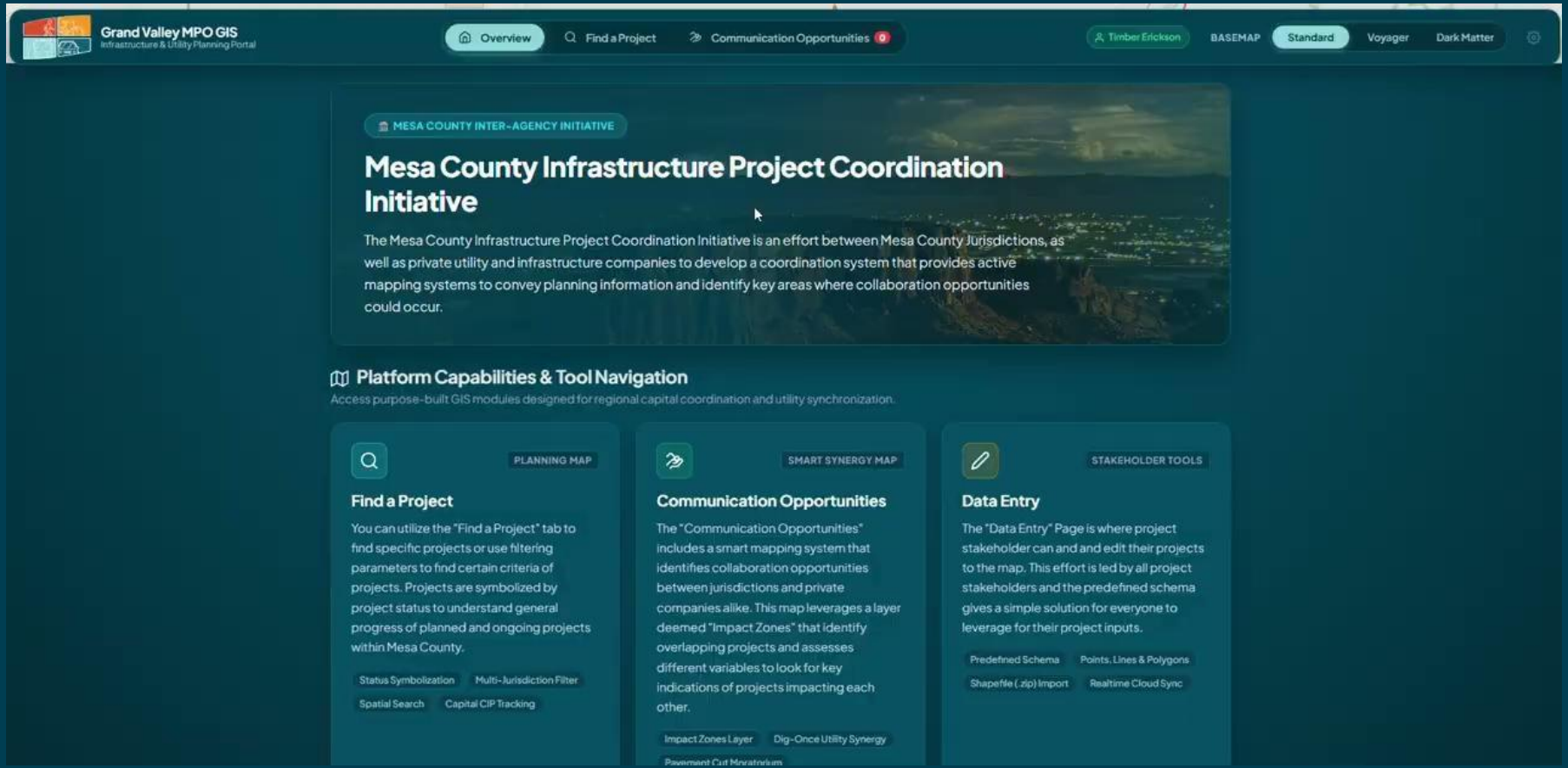
Find a Project:



Data Entry:


Grand Valley MPO GIS
Infrastructure & Utility Planning Portal
Overview
Find a Project
Communication Opportunities
Timber Erickson
BASEMAP
Standard
Voyager
Dark Matter
MESA COUNTY INTER-AGENCY INITIATIVE
Mesa County Infrastructure Project Coordination Initiative
The Mesa County Infrastructure Project Coordination Initiative is an effort between Mesa County Jurisdictions, as well as private utility and infrastructure companies to develop a coordination system that provides active mapping systems to convey planning information and identify key areas where collaboration opportunities could occur.
Platform Capabilities & Tool Navigation
Access purpose-built GIS modules designed for regional capital coordination and utility synchronization.
PLANNING MAP
Find a Project
You can utilize the "Find a Project" tab to find specific projects or use filtering parameters to find certain criteria of projects. Projects are symbolized by project status to understand general progress of planned and ongoing projects within Mesa County.
Status Symbolization
Multi-Jurisdiction Filter
Spatial Search
Capital CIP Tracking
SMART SYNERGY MAP
Communication Opportunities
The "Communication Opportunities" includes a smart mapping system that identifies collaboration opportunities between jurisdictions and private companies alike. This map leverages a layer deemed "Impact Zones" that identify overlapping projects and assesses different variables to look for key indications of projects impacting each other.
Impact Zones Layer
Dig-Once Utility Synergy
Pavement Cut Moratorium
STAKEHOLDER TOOLS
Data Entry
The "Data Entry" Page is where project stakeholder can and and edit their projects to the map. This effort is led by all project stakeholders and the predefined schema gives a simple solution for everyone to leverage for their project inputs.
Predefined Schema
Points, Lines & Polygons
Shapefile (.zip) Import
Realtime Cloud Sync

Communication Opportunities:



The Backend:

A secure Supabase PostGIS backend ensures robust spatial data storage and strict access control.

01

PostGIS & Spatial Data Storage

The platform is powered by a real-time Supabase PostgreSQL instance with the PostGIS extension enabled, utilizing GeoJSON display and PostGIS Geometry storage.

02

Client Security & Access Control

Client security is strictly maintained using a publishable anonymous key governed by Row Level Security (RLS). No sensitive service secrets or backend admin tokens are exposed in client bundles.

03

Session & Stakeholder Validation

The architecture enforces strict session token validation with auto-expiry and whitelisted stakeholder validation.

Custom GIS Solution vs. Standard ESRI Tools

Unlocking tailored security, specialized capabilities, and frictionless regional collaboration

Row-Level Security (RLS)

Custom GIS Advantage
Supabase PostGIS database-level RLS protects sensitive project assets dynamically.

ESRI Experience Builder
Layer-level or org-wide ACLs; complex & costly custom security setups for external entities.

Targeted Capabilities

Custom GIS Advantage
Purpose-built synergy screening, ROW impact calculation & multi-geometry drawing workflows.

ESRI Experience Builder
Generic out-of-the-box widgets with heavy visual clutter and rigid workflow constraints.

Cross-Agency Process

Custom GIS Advantage
Streamlined coordination between public jurisdictions & private utility partners.

ESRI Experience Builder
Strict named-user licensing friction and siloed organizational boundaries.

AI "Vibe" Coding & Targeted Software Development

Tailoring GIS applications to streamline highly specialized, niche municipal workflows

01 AI "Vibe" Coding

Rapid Iterative Prototyping

Leverages modern AI code generation to rapidly translate complex domain intuition into fully functional custom web apps.

Domain-Centric Design

Allows non-traditional developers and planners to directly direct software behavior without enterprise overhead.

02 Targeted GIS Use Cases

Hyper-Focused Functionality

Replaces bloated, generic GIS viewers with laser-focused tools built specifically for niche workflows.

Zero Technical Friction

Eliminates heavy GIS learning curves, empowering cross-departmental stakeholders to map projects instantly.

03 Review & Expertise Requirements

Structure & Knowledge Needed

AI doesn't get everything right and shouldn't be implemented in every single component of the application.

Understand What is at Stake

Security risks, data breaches, or costly bugs could hinder effectiveness of your solution.

04 Educated Prompting & Systems Literacy

Architectural Awareness

Understand backend systems, data models, and constraints before generating code prompts (i.e, ETL's, Data types, RLS, React elements).

Production-Grade Engineering

Move beyond basic prototypes by prompting for scalable, secure, and maintainable production solutions.

User-Centric Design & Project Phasing

Developing through the end-user perspective with iterative prototyping and beta testing

End-User POV

Stakeholder Alignment

- **User-Based Design:** Build around operational workflows rather than backend convenience.
- **Ensure Buy-in:** Functionality and and actual usefulness helps build a foundation for stakeholder buy in and more effort invested in contributions.
- **Zero Friction:** Prioritize intuitive UI to minimize learning curves and maximize adoption.

Iterative Prototyping

Early Concept Validation

- **Rapid Mockups:** Translate domain intuition into functional prototypes early in development (ESRI vs custom).
- **Risk Reduction:** Catch logic gaps and workflow issues before heavy engineering investment.
- **Dynamic Scope:** Refine technical requirements based on real interaction rather than static specs.

Beta Testing Phase

Real-World Deployment

- **Controlled Rollout:** Test with key partner departments in active operational environments.
- **Stress Testing:** Validate reliability, data security, and multi-agency access rules under load.
- **Sustained Buy-In:** Build long-term confidence and ownership across partner organizations.

Infrastructure Planning Success Roadmap

5-stage process from issue identification to sustained stakeholder alignment

01

Issue Identification

Identified key issues within current infrastructure planning processes, targeting core **communication bottlenecks**.

02

Integrated Analysis

Drafted a multi-faceted solution leveraging **spatial, temporal, and fiscal** data to uncover communication opportunities.

03

Prototype & Testing

Constructed prototypes, gathering **expert and end-user feedback** during beta tests to publish a well-rounded product.

04

AI Acceleration

Leveraged AI coding workflows to expedite application development and bridge **small domain** expertise gaps.

05

Stakeholder Alignment

Sustained **Sustainability** through semi-annual meetings, building a strong "buy-in" culture with utility providers.

Questions or Comments?

Portal Link: