1. Visualization Adoption Roadmap

This guide is meant to be practical. Agencies are at very different points when it comes to data visualization — some are just getting started with spreadsheets and maps, others already have dashboards running, but want to raise the bar. Wherever you are, the goal here is to help you take the next step.

If you've already filled out the Self-Assessment Worksheet, start by looking at the areas where your scores came in lowest. That's usually where you'll see the biggest opportunities for growth.

We've organized the guide around six areas that together make up a strong visualization practice:

1. **Tools & Technology:** Getting the right tools in place, piloting them, and eventually scaling them across teams.
2. **Skills & Staffing:** Making sure people have the time, training, and support to use visuals well.
3. **Leadership & Governance:** Building buy-in and setting expectations so visuals become part of everyday decision-making.
4. **Communication Strategy:** Making sure visuals are tied to clear messages and the needs of your audience.
5. **Data Infrastructure & Governance:** Ensuring the data behind visuals is reliable, consistent, and accessible.
6. **Evaluation & Feedback Loops:** Learning what works, fixing what doesn't, and improving over time.

In each section, you'll find practical steps for moving from "emerging" practices to more developed and mature ones, plus examples from agencies that have already tried these approaches. Use the summary roadmap as a quick reference for what progress can look like across the six areas, and then dig into the sections that match your agency's needs.

Competency Area	Emerging (Getting Started)	Developing (Building Systems)	Mature (Sustaining & Innovating)
1. Tools & Technology	Staff use basic tools (Excel, PPT, GIS exports); ad hoc visuals	Teams pilot advanced tools (Power BI, Tableau, ArcGIS), begin consistent workflows	Tools are integrated with systems; agency uses templates and automation across teams
2. Skills & Staffing	A few individuals create visuals; little training or support	Visualization roles, trainings, and peer learning networks emerge	Visualization is a shared skill across departments; job descriptions and mentorships in place
3. Leadership & Governance	Occasional leadership support; no formal expectations	Some leaders champion visuals; basic standards or expectations set	Leaders model best practices; visualization policies and governance structures guide practice
4. Communication Strategy	Visuals created without audience in mind; limited messaging	Staff begin tailoring visuals by audience and using narrative callouts	Strategic communications staff co-develop visuals; visuals are part of campaigns and planning
5. Data Infrastructure	Key datasets exist but are siloed or unstandardized	Shared data folders, documentation, and informal data stewards	Automated pipelines, centralized access, and clear governance of data for visualization
6. Evaluation & Feedback	Visuals rarely reviewed after release	Staff gather informal feedback; some visuals adapted over time	Structured feedback loops, embedded metrics, and continuous improvement inform visual design

1.1. Growing Your Tools & Technology

1.1.1. From Emerging to Developing

Most agencies start out with whatever's at hand: Excel charts, PowerPoint maps, maybe a few static GIS exports. That's fine for a while, but as soon as people want to tell bigger stories with data, those tools hit their limits.

A practical first step is simply taking stock. What licenses does your agency already own? Who's actually using them? You may already have a few early adopters tinkering with Tableau, Power BI, or ArcGIS StoryMaps. It helps to find them and make their work more visible.

Next, pick one problem worth solving. Don't overcomplicate it. Perhaps it's visualizing safety trends for leadership or creating a clearer chart for a public survey. Pilot one tool or workflow in that context, and support a small team in trying it out.

Some agencies have even set up quick "show-and-tell" sessions — 15 minutes at a staff meeting where someone shares a dashboard or map they've been experimenting with. These small steps matter. They signal that experimentation is encouraged, and they create a record of what worked (and what didn't). Over time, this shifts visualization from being an ad hoc effort to something more intentional and repeatable.

Sample 90-Day Plan:

Quick Wins (first 90 days):

- ✓ Take stock of what you already have. Make a simple list of your licenses and tools. You might be surprised at what's hiding in different divisions.
- ✓ Pick one high-value project (like safety trends or a public survey) and test a tool or workflow there. Keep the scope small but visible.
- ✓ Capture a "before and after" example. Even one upgraded chart can help show leadership why this work matters.

Medium-Term Goal (3–6 months):

- ✓ Try out a new visualization platform (like Tableau or Power BI) on a public-facing product. A dashboard or report that gets outside eyes will surface both the potential and the gaps.

Collaboration Idea:

- ✓ Host a short session with planning, IT, and communications to map out shared needs. Sometimes you'll find three teams building the same chart in three different ways.

1.1.2. From Developing to Mature

Agencies that have moved beyond initial pilots often face a new challenge: how to scale effective visualization practices across teams, programs, and leadership levels. At this stage, the goal is no longer just access to tools, it's creating the infrastructure and support that make high-quality visuals routine and reliable.

This means making access equitable across relevant teams, standardizing how tools are used, and creating reusable templates and workflows that reduce duplication and improve consistency. Coordination with IT becomes essential, both to expand access to licensed tools and to ensure that data connections are secure, up to date, and automated where possible. Teams should also consider interoperability, specifically how visuals integrate with broader platforms like performance dashboards, planning reports, or legislative briefings.

Sample 90-Day Plan:

Quick Wins (first 90 days):

- ✓ Draft 1–2 branded templates or visual styles that anyone can grab.
- ✓ Document a couple of common "data-to-visualization" workflows so new staff can follow them.
- ✓ Review existing dashboards or reports to find spots where automation could save staff time.

Medium-Term Goal (3–6 months):

- ✓ Set up a clear internal request process (for example, an intranet form) so staff know where to go for visualization help and templates.

Collaboration Idea:

- ✓ Start a working group or community of practice around visualization. Agencies that do this often find it's the best way to spread lessons learned and build momentum.

1.1.3. Case Study

Texas DOT (TxDOT) - Tableau Community of Practice

The Texas Department of Transportation (TxDOT) illustrates how agencies can evolve from early-stage visualization efforts to a more mature, strategic approach. Rather than focusing solely on tools, TxDOT prioritized internal capacity-building and peer learning through a Tableau Community of Practice (CoP).

The CoP brought together staff from across disciplines for regular office hours and meetings to share dashboards, troubleshooting challenges, and tailor visuals to audience needs. This structure helped lower barriers for new users and fostered a culture of experimentation.

Organizationally, TxDOT addressed common hurdles like licensing and IT coordination, while developing shared templates and tip sheets to promote consistency. By aligning tool use with real agency needs, such as performance tracking and public engagement, they created a sustainable model for scaling visualization practices agency-wide. They use some of the following free and low-cost resources:

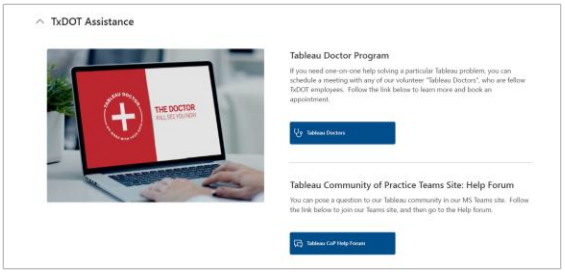

Figure 1: A screenshot of TxDOT's internal SharePoint site dedicated to the Tableau Community of Practice.

- LinkedIn Learning (Free and low-cost data visualization courses are available for a wide range of software)
- Esri Massive Open Online Courses (MOOCs)
- Coursera (Free and low-cost data visualization courses are available for a wide range of software)

1.2. Growing Your Skills and Staffing

1.2.1. From Emerging to Developing

Tools alone don't move the needle, people do. Agencies often hit a wall when staff simply don't have the time, training, or confidence to use new visualization tools effectively. The first step is to look inside your own organization. Who already shows an interest in visuals? It might be a planner who always sneaks charts into their memos, or an engineer who enjoys experimenting with GIS exports. These early enthusiasts can become the spark for broader momentum.

90-Day Plan for Getting Started:

- ✓ Spot the people already creating visuals (or eager to learn) and invite them into the conversation.
- ✓ Share simple skill-building aids — quick feedback checklists, one-page "when to use which chart" guides, or resources included in this Visualization Adoption Roadmap.
- ✓ Add a small but telling prompt to project planning forms: "Will this task include visuals? If so, who's creating them?" Even that gentle nudge can raise awareness.

Medium-Term Goal (3–6 months):

- ✓ Test a lightweight training effort. This could be a short tutorial series, a lunch-and-learn on chart design, or a quick GIS mapping walkthrough led by a staff member.

Collaboration Idea:

- ✓ Pair up staff across functions — for example, an analyst with a communications specialist — and have them co-develop a visual for a shared project. Both sides will learn from the experience.

1.2.2. From Developing to Mature

As your agency builds experience with data visualization, the next step is to scale that capacity across teams and make it sustainable and consistent. Moving from a few capable individuals to a well-supported, cross-functional talent pool requires some intentional planning. This includes creating structures for collaboration, formalizing responsibilities, and embedding visualization expectations into roles and workflows.

90-Day Plan for Scaling Up:

- ✓ Refresh one or two job descriptions to include visualization skills as part of the role.
- ✓ Add visualization targets to annual training goals or staff development plans.
- ✓ Launch a peer review process for visuals in internal reports or dashboards — even a simple checklist helps.

Medium-Term Goal (3–6 months):

- ✓ Create an internal training track or mentoring program so advanced staff can coach newer learners.

Collaboration Idea:

- ✓ Convene a cross-functional task group (planning, communications, data) to co-create a “starter guide” with agency-specific tips and examples of effective visuals.

1.2.3. Case Study

MnDOT District Visualization Support

MnDOT’s approach to supporting its districts in developing visualization skills illustrates how to nurture internal talent and build shared capacity. While each district had different needs and levels of technical expertise, the central office

promoted cross-district learning by offering branded templates, peer-developed tools, and informal mentoring. This decentralized but connected approach helped elevate visualization quality across the agency, supporting planners, designers, and public engagement staff. MnDOT's strategy emphasizes the importance of growing staff skills not only through training, but by fostering an internal culture where sharing and experimentation are encouraged.

1.3. Growing Your Leadership and Governance Capacity

1.3.1. From Emerging to Developing

Leadership plays a critical role in shaping a culture where visual communication is valued and expected. Without leadership buy-in, even talented staff and strong tools can struggle to gain traction. Start by identifying a champion, someone in a leadership role who supports visual communication and is willing to model it in meetings, briefings, or public presentations. Encourage staff to use visuals when preparing materials for leadership and prompt leaders to request visual summaries.

Equally important is recognizing and celebrating when staff produce compelling visuals. Small signals matter. Even informal praise in emails or meetings can validate effort and encourage others. Establishing light-touch expectations (e.g., "Include a summary graphic in every board briefing") can set a consistent tone without requiring major policy changes.

Sample 90-Day Plan:

- ✓ Identify one or two leaders willing to champion visualization and use visuals in their own communications.
- ✓ Encourage visuals in executive briefings and reports — start by adding one key chart or map.
- ✓ Showcase a strong internal example in a leadership meeting or email to spotlight good work.

Medium-Term Goal (3–6 months):

- ✓ Ask leadership to adopt a standing expectation: each major report or plan should include at least one visual summary.

Collaboration Idea:

- ✓ Host a short working session with staff and leadership to look at visuals from recent projects. Discuss which ones landed well, which didn't, and why.

1.3.2. From Developing to Mature

As agencies progress, the focus shifts to embedding visualization into leadership routines, decision-making processes, and governance frameworks. The goal is to move beyond isolated champions toward a culture where expectations, resources, and accountability for visualization are clearly established.

This means setting formal expectations for visual quality and inclusion, through strategic plans, performance frameworks, or project management guidance. Leaders should be involved in visual reviews, providing feedback and helping staff refine their communication. Strong leadership support also means making investments: allocating resources for staffing, training, or platform access, and using governance tools like branding standards or reporting requirements to reinforce consistency and quality.

Sample 90-Day Plan:

- ✓ Develop templates for executive dashboards or briefing visuals that leaders can use and request consistently.
- ✓ Launch a "visual of the month" spotlight led by leadership to recognize strong examples.
- ✓ Collect and document where visuals are already shaping strategic decisions — use those stories to reinforce the value.

Medium-Term Goal (3–6 months):

- ✓ Establish or formalize a governance structure (e.g., visualization standards, internal review steps, or visual storytelling goals).

Collaboration Idea:

- ✓ Form a cross-departmental task force (planning, public affairs, performance, etc.) to co-develop agency-wide visual guidelines and review protocols.

1.4. Growing Your Communication Strategy

1.4.1. From Emerging to Developing

A visual that's technically correct isn't always effective. At the early stage, agencies often crank out charts or maps that look fine but don't land with their audience. The goal here is to move from just "producing visuals" to actually *communicating messages*.

Start with your audiences. Who do you serve most often — the public, executives, engineers, legislators? Each one needs different framing. Pair every chart or map with a short takeaway statement that explains *what the data shows* and *why it matters*.

When in doubt, ask: *Who is this for? What do we want them to learn or do?* Even a checklist or a consistent way of writing titles can make visuals sharper and easier to understand.

Sample 90-Day Plan:

- ✓ Add takeaway statements or more descriptive titles to visuals in reports and presentations.
- ✓ Encourage staff to try a simple "Know Your Audience" worksheet before creating visuals (similar to the "Defining Clear Objectives" exercise in this guide).
- ✓ Take one recent report and revise a few visuals for clarity or alignment with strategic messages — use it as a learning example.

Medium-Term Goal (3–6 months):

- ✓ Build a short messaging checklist or slide template that has space for both the graphic and the "so what" statement. Prompts like "This chart shows..." or "This matters because..." are good starting points.

Collaboration Idea:

- ✓ Pair up analysts and communications staff to revise an existing visual together for a public audience. Both sides will see how much clearer the end product can be.

1.4.2. From Developing to Mature

Once basic audience-tailoring is in place, the next step is weaving visualization into the agency's broader communication strategy. That means thinking about visuals at the start of a project, not as decoration at the end. It also means using visual storytelling — building a sequence of graphics that guides viewers through trends, comparisons, or trade-offs.

At this level, cross-team collaboration is essential. Planning, data, and communications staff should routinely co-develop visuals so that technical accuracy and message clarity go hand in hand. Agencies should also track impact: are visuals reused? Do they influence decisions? Do they boost public engagement?

Sample 90-Day Plan:

- ✓ Collect a few "before and after" examples where messaging improved the clarity of visuals — share them as learning tools.
- ✓ Add storytelling tips and sample visuals to internal communication guidelines.
- ✓ Audit existing visuals for tone, voice, and alignment with agency priorities.

Medium-Term Goal (3–6 months):

- ✓ Create a reusable template that includes both the graphic and narrative framing elements (e.g., "What you should know..." or "This means...") for public-facing products.

Collaboration Idea:

- ✓ Convene a cross-functional working group (communications, planning, public affairs) to develop shared messaging tools and pick out visuals for upcoming outreach campaigns.

Case Study: Caltrans 360 Visualization for Public Engagement

Caltrans' use of immersive 360-degree tours exemplifies audience-centered design and visual storytelling. These tools allow the public to virtually navigate proposed projects and understand design trade-offs in real-world environments. By overlaying spatial annotations and using interactive navigation, Caltrans has made complex engineering proposals more accessible and engaging. The agency uses these visuals in public outreach meetings, reflecting an intentional strategy to align visualization formats with communication goals. This case shows how effective visuals can support public understanding, trust, and meaningful participation.

Figure 2: Screenshot of Caltrans' animated drive-through video showcasing the new Yerba Buena Island Exit.

1.5. Data Infrastructure & Governance

1.5.1. From Emerging to Developing

Good visuals depend on good data, and for many agencies, that's where the cracks show first. Early on, it's common to see siloed spreadsheets, outdated files, or staff hunting through old folders for the "latest" version. The starting point is simple: figure out what you have, who owns it, and where it lives.

Take inventory of the datasets most often used for visuals, especially in performance reporting, planning, safety, or asset management. Identify both formal and informal data stewards. Sometimes it's an IT manager, other times it's just the one analyst who knows where the files are. Then, create shared access points (like common drives or folders) so everyone is working from the same source.

Even small steps like building a basic data dictionary with definitions, units, and update frequency can reduce confusion and create consistency. These foundational practices shift the agency from reactive data wrangling toward a more strategic, shared approach.

Sample 90-Day Plan:

- ✓ List 10 or so datasets most commonly used in visuals.
- ✓ Identify who maintains them and where they're stored.
- ✓ Draft a simple data dictionary to capture definitions, units, and update frequency.

Medium-Term Goal (3–6 months):

- ✓ Set up a shared "data shelf" — a central location where approved visualization datasets are stored and kept up to date.

Collaboration Idea:

- ✓ Bring planning, safety, and IT staff together to review the dataset list. Use the session to spot overlaps, gaps, and opportunities for shared stewardship.

1.5.2. From Developing to Mature

Once the basics are in place, the next challenge is scale. At this stage, the goal is to replace manual updates and inconsistent sources with automated pipelines and clear governance. That way, staff can trust the data that feeds their dashboards, maps, and reports.

Start by connecting visualization tools directly to source systems wherever possible, reducing the need for manual updates. Formalize governance roles such as data

stewards and create internal policies for update schedules, review protocols, and access control.

Develop an authoritative "source of truth" platform or catalog where staff can easily find approved datasets for visual reporting. Work with IT to manage permissions and security protocols, especially if visuals include sensitive or public-facing information. These steps reduce friction, improve trust in the data, and allow visualization efforts to scale efficiently across the agency.

Sample 90-Day Plan:

- ✓ Document current governance roles and identify any gaps.
- ✓ Draft a checklist with IT for dashboard/data platform deployment — covering refresh schedules, permissions, and security.

Medium-Term Goal (3–6 months):

- ✓ Develop a full roles-and-responsibilities chart for data governance, filling the gaps identified earlier.

Collaboration Idea:

- ✓ Meet jointly with IT and public affairs staff to set permissions for both internal and public-facing datasets, ensuring access is clear and appropriate

1.5.3. Case Study

WSDOT Travel Trends Dashboard

WSDOT's Travel Trends Dashboard was developed to support ongoing performance reporting through a structured, reliable data infrastructure. The system uses Python and Django for backend data processing and publishing, enabling automated updates and integration with internal databases. Tableau is used for the visual front-end, allowing users to explore multimodal travel patterns through interactive dashboards. The data pipeline incorporates scheduled refreshes, version control, and quality checks to flag anomalies before publishing. Governance roles are clearly defined, with a dedicated team responsible for maintaining source datasets, managing the end-to-end data

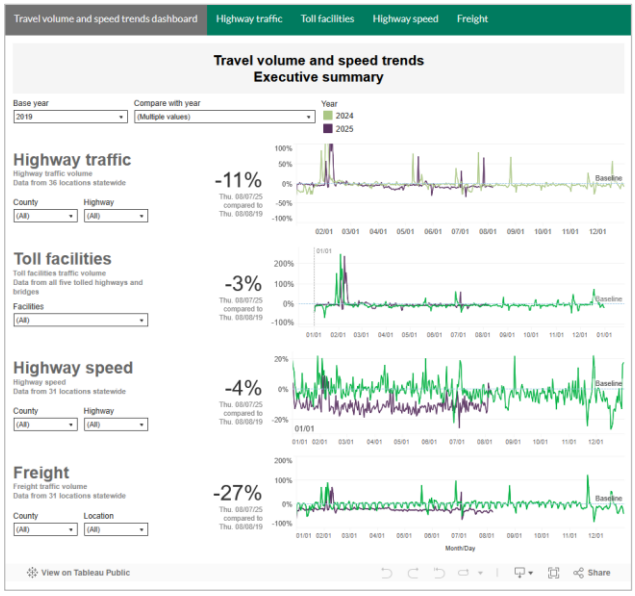

Figure 3: WSDOT's travel volume and speed trends dashboard.

pipeline, and ensuring alignment with planning and performance reporting goals. This robust infrastructure has helped WSDOT deliver consistent, trustworthy visualizations that support both internal decision-making and public transparency.

1.6. Growing Your Evaluation & Feedback Loops

Strong visual communication evolves over time. Agencies that build evaluation into their routine learn faster, adapt more easily, and earn more trust from their audiences. Feedback loops help you spot what's working, fix what isn't, and keep improving clarity, accessibility, and impact over time.

1.6.1. From Emerging to Developing

Start small. The first step is to create a lightweight way to capture feedback. That could mean a quick debrief after releasing a report, or simply asking a colleague or end user: *"Was this clear?"* or *"What stood out to you?"* Even informal input can reveal how visuals are actually being read and whether they're helping decision-making.

Usage data is another easy entry point. Tracking dashboard views, downloads, or email open rates won't tell the whole story, but it gives you a baseline for audience engagement.

Sample 90-Day Plan:

- ✓ Add a single feedback prompt to a dashboard or visualization (e.g., "Was this useful?").
- ✓ Start tracking basic usage stats like page views, downloads, or meeting mentions.
- ✓ Keep a running "lessons learned" deck where staff capture quick notes on what worked well or fell flat.

Medium-Term Goal (3–6 months):

- ✓ Add a reflection step into at least one project close-out: a slide or short discussion on whether the visuals were effective.

Collaboration Idea:

- ✓ Ask a communications or external affairs staff member to review a new visual and give audience-centered feedback.

1.6.2. From Developing to Mature

Once agencies are comfortable gathering input, the next step is to make it part of everyday workflow. This means moving from ad hoc feedback to structured processes that collect, analyze, and respond to input. Formal feedback channels, such as surveys

or interactive comment boxes, can help gather structured input. Use this feedback to identify recurring issues and address them through training or updates to style guides. Make sure to close the loop: when feedback is received, let users know how it influenced future updates.

Sample 90-Day Plan:

Case Study

- ✓ Add a short feedback form to one high-visibility report or dashboard.
- ✓ Create or update a feedback checklist for internal reviews.
- ✓ Collect 3–5 examples where user feedback led to improvements and share them across teams.

Medium-Term Goal (3–6 months):

- ✓ Launch a quarterly review of feedback trends and use it to guide agency-wide updates to visuals, messaging, or templates.

Collaboration Idea:

- ✓ Convene a “visual feedback roundtable” with staff from different departments to review recent visuals and share takeaways for future work.

Florida DOT Source Book

FDOT’s Source Book dashboard was created as both a reporting tool and an evolving resource shaped by stakeholder feedback. After the initial publication, the team realized the dashboard was being underutilized. In response, they hosted a rollout webinar during a quarterly Florida Metropolitan Planning Partnership meeting and followed up with an email blast to increase visibility and engagement. These sessions also served as an opportunity to gather feedback directly from users.

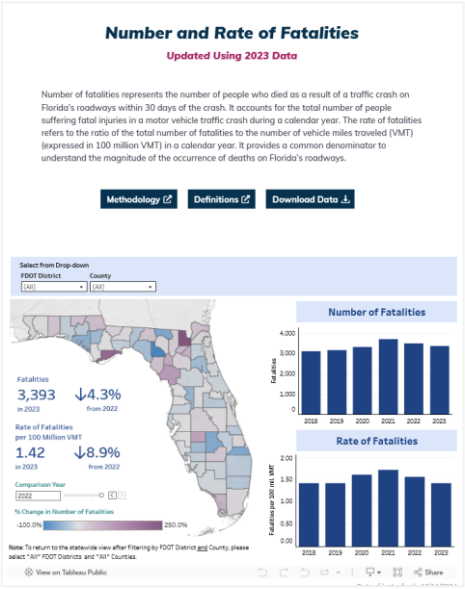

Figure 4: The FDOT Source Book’s number and rate of fatalities page with GIS

FDOT has since made enhancements, including the addition of GIS-based segment-level visualizations that allow users to explore performance metrics on an interactive map. FDOT has also compiled documented use cases from FDOT offices and partners, showcased in the recorded webinar "Exploring Capabilities of FDOT Source Book." This case highlights the importance of ongoing engagement, documentation, and continuous iteration to strengthen the value and utility of a performance dashboard.