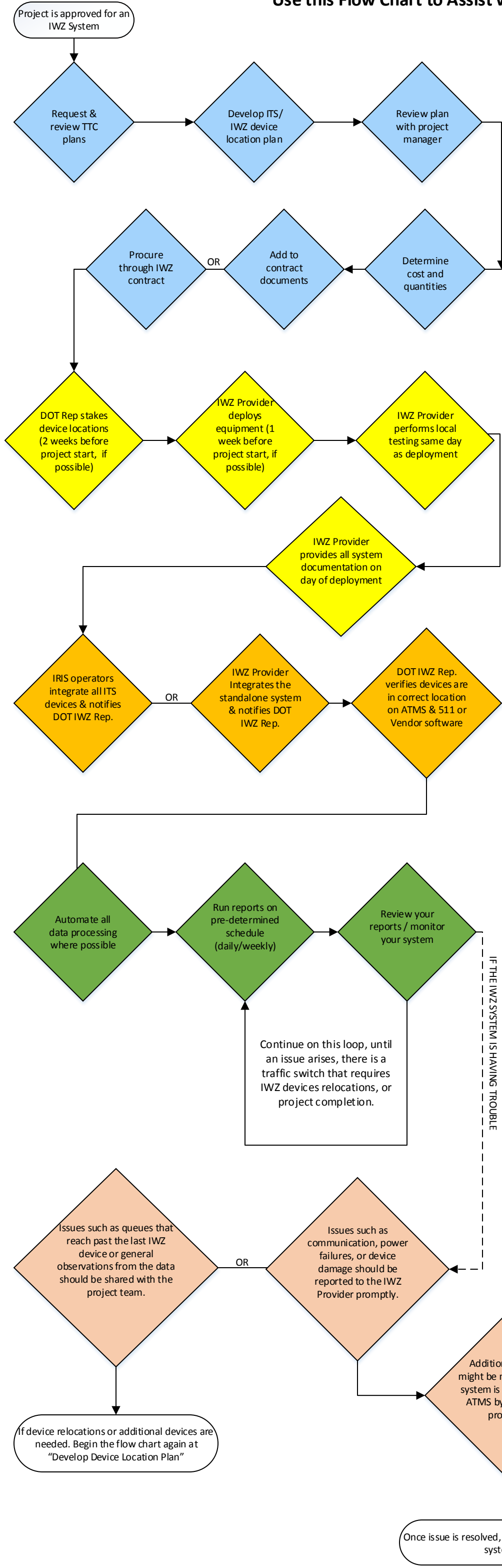


Use this Flow Chart to Assist with ITS/IWZ System Deployments



System Planning

- Considerations for Alternate Route Travel Times:**
- Alternate route travel times are calculated and displayed for selected alternate route(s) and the main route through the work zone to provide options to drivers.
 - Device layout is based on routes with a detector placed at key intervals or origin/destination points.
- Considerations For Queue Detection:**
- Primary detector is located 0 to 600' in advance of lane closures.
 - With additional detector spacing at ½ mile to 1 mile (1.25 max spacing).
 - PDMS placement should be at points where vertical or horizontal sight distance is limited avoiding static signs in the area. Preference should also be given for locations ½ to 1.5 miles in advance of exits, so they can also be used to divert traffic.
- Considerations for Traffic Monitoring:**
- Speed/volume sensors should also be placed within work zones that are greater than 1500' in length.
 - Sensors within a work zone should be spaced at ½ to 1 mile intervals and should collect data from both directions of travel when possible.
 - Queue detection sensors also act as monitoring sensors.
 - Portable DMS should be placed ½ to 1.5 miles in advance of each exit within a work zone. These PDMS should also be programmed for queue detection when possible.
- Other items:**
- Portable temporary or permanent ITS devices can be used for IWZ applications.
 - These are just guidelines and all systems will need to be adjusted on a per-project basis.

System Deployment

- Considerations Staking:**
- Having a MnDOT representative stake the IWZ deployments allows for a field review of conditions that the IWZ Provider will face during deployment. Adjustments can then be made in the field.
- Project Documenting:**
- The day of device deployment the IWZ Provider must provide: testing documentation, device name, GPS location, and IP Address for each device to MnDOT IRIS integrator & DOT representative.
 - If a stand alone system is to be used – system login information should be provided to the DOT IWZ representative at this time.
- Site Visit:**
- If possible drive the work zone (before and after TTC) is installed. If signs seem too far from or too close to decision points, pinch points, or other devices work with your IWZ Provider to make adjustments.

System Integration

- Integration Considerations:**
- Early deployment and integration allows time for the system to be monitored and tested through it's reporting software before project start.
 - All queue logic, Travel Alert Messages, and system automation should be programmed at this time.
 - If issues arise, there is time for troubleshooting before construction begins.
 - If a stand alone IWZ system is deployed, the IWZ Provider should integrate all of the devices, needed logic, and messaging; as well as provide the DOT IWZ Rep. with training on the software being used or a user manual, at minimum.
 - All automated reporting should be set up at this time.
 - If the system will be integrated into ATMS a representative from the RTMC should be informed of the temporary deployment.

System Monitoring

- Considerations for System Monitoring:**
- Automate all systems where possible – data download, data review, graph output, etc.
 - Determine monitoring schedule – daily or weekly is appropriate if real-time monitoring is not possible.
 - Use data processing outputs that are created to easily visually determine failures or breakdowns of the system such as speed graphs, and conditional formatting of data sets. Setting up outputs that are easy to visually scan for errors will dramatically cut down on report review time.
 - Review your reports!
 - Issues such as communication, power failures, and damaged IWZ equipment can typically be quickly handled by the IWZ Provider – if reported directly to them.
 - Issues such as longer than anticipated queues or general observations from the data should be reported to the project team. If longer than anticipated queues are the issue either relocating the current devices or adding additional devices should be discussed.

System Troubleshooting

- Considerations for System Troubleshooting:**
- Issues such as communication, power failures, and damaged IWZ equipment can typically be quickly handled by the IWZ Provider – if reported directly to them.
 - If the issues involve communication errors and the system is run through ATMS, additional assistance may be needed from the ATMS provider.
 - Issues such as longer than anticipated queues or general observations from the data should be reported to the project team. If longer than anticipated queues are the issue either relocating the current devices or adding additional devices should be discussed.

Acronym Key
ITS – Intelligent Transportation System
IWZ – Intelligent Work Zone
TTC – Temporary Traffic Control
DOT – Department of Transportation
RTMC – Regional Traffic Management Center
ATMS – Advanced Traffic Management Software
IRIS – Intelligent Roadway Information System (MnDOT open source ATMS)
PDMS – Portable Dynamic Message Sign
GPS – Global Positioning System
DOT Rep. – A DOT Employee or anyone acting on behalf of the DOT
IWZ Provider – Provides of temporary ITS equipment