Kansas Department of Transportation
KDOT PMS TPR #26
Pavement Management System
Business Analysis Project

Replacement Pavement Management System (R-PMS)
Requirements

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ID	Requirement Name	Brief Description	Priority M-Mandatory E - Expected D-Desirable	Vendor Response F - Fully Meets P - Partially Meets A - Alternate Solution N- Does not meet	Vendor Comments/Explanation: Provide details on any requirement for which your solution only Partially Meets or has an Alternate method of solving the requirement than requested including the extent to which the requirement is met.
1	**General System Requirements**				
1.1	Compliance	The solution shall maintain compliance with Kansas Statutes, Rules and Regulations of KDOT, Kansas Department of Administration and Kansas IT Executive Council (ITEC) as described or referenced in the Request for Proposal and its attachments.	M		
2	**Pavement Funding Programs**				
2.1	Provide Analysis to develop and support pavement funding program based on future desired conditions	The solution must compute the necessary funding requirements given current pavement conditions, deterioration models, action costs and post action models, constraints on work types, economic assumptions, and desired pavement conditions at specific periods (at least 12 years) including the possibility of variable inputs and output for each year in the analysis.	M		
2.1.1	Allow for pavement condition flexibility	The solution must accommodate pavement conditions (both current and desired) as defined by KDOT both in terms of the components (roughness, rutting, cracking, structural assessment, friction, ...) and aggregation (points, 1/200th mile linear, 10th mile linear, nominally 1 mile segmented, project limits). Note that this requirement also will apply under 2.2 (funding programs), 3.1 (1R Projects), and 3.2 (3R Projects).	M		
2.1.1.1	Allow for pavement condition definition set naming	The solution is expected to accommodate grouping and naming pavement condition sets to facilitate easy selection of the different condition combinations (Fed PM, KDOT surface only, KDOT surface +structure, ...).	E		
2.1.2	Allow for condition deterioration model flexibility	The solution must accommodate pavement condition deterioration models (and post-action models) as defined by KDOT both in terms of the form (from linear deterministic to potentially Markov stochastic) and aggregation (points, 1/200th mile linear, 10th mile linear, nominally 1 mile segmented, project limits, family, system).	M		
2.1.2.1	Allow for pavement deterioration model definition set naming	The solution is expected to accommodate grouping and naming pavement deterioration model sets to facilitate easy selection of the different model combinations (RM only, historic derived, Delphi fit, ...).	E		
2.1.3	Allow for action feasibility and cost flexibility	The solution must accommodate action categories and specific action feasibility and unit costs as defined by KDOT recognizing variability based on location, prior pavement condition, user costs, and Agency costs.	M		

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2.1.3.1	Allow for pavement action set naming	The solution is expected to accommodate grouping and naming pavement action sets to facilitate easy selection of the different action combinations (light, robust, ...).	E		
2.1.4	Allow for work type constraint flexibility	The solution must accommodate constraints on work types (and some actions) as defined by KDOT possibly including limits on dollars by work types and/or limits on miles (or area) by work types (and some actions - e.g. no more than x miles of Chip Seals recommended in a year due to chip supply limits).	M		
2.1.4.1	Allow for constraint set naming	The solution is expected to accommodate grouping and naming work type (and some action) constraint sets to facilitate easy selection of the different constraint combinations (RM%, Light%, Medium%, Heavy% with max Chips Seals of 200 miles).	E		
2.1.5	Allow for economic assumption flexibility	The solution must accommodate the time value of money as defined by KDOT which typically follows UMB Circular 94 and includes both an appropriate inflation designation and an interest rate to compute a discount rate that is consistent with long-term investment in infrastructure.	M		
2.2	Provide Analysis to develop and support pavement future condition based on different funding programs	The solution must compute the future pavement conditions given current pavement conditions, deterioration models, action costs and post action models, constraints on work types, economic assumptions, and anticipated funding at specific periods (at least 12 years). NOTE: The requirements under 2.1.x also apply under 2.2 but now for Funding Program Analysis.	M		
3	**Pavement Project Selection Processes**				
3.1	Provide Analysis to develop and support the "1R" pavement project selection process	The solution must generate district mileage allotments and candidate projects with scopes for the annual "1R" project recommendations given current pavement conditions, deterioration models, action costs and post action models, constraints on work types (including existing layer factors that influence practical work types and structural evaluation influences), economic assumptions, and desired pavement conditions at specific periods (at least 5 years) including the possibility of variable inputs and output for each year in the analysis. NOTE: The requirements under 2.1.x also apply under 3.1 but now for "1R" Project Recommendation Process.	M		

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3.2	Provide Analysis to develop and support the pavement portion of the "3R" project selection process	The solution must generate candidate projects with scopes for "3R" projects given current pavement conditions, deterioration models, action costs and post action models, constraints on work types (including existing layer factors that influence practical work types and structural evaluation influences), economic assumptions, and desired pavement conditions at specific periods (at least 5 years) including the possibility of variable inputs and output for each year in the analysis. NOTE: The requirements under 2.1.x also apply under 3.2 but now for "3R" Project Recommendation Process.	M		
3.3	Provide Data or Interface to Feed the Priority Formula	The solution must produce and provide relevant data (Roughness, Rutting, Equivalent Transverse Cracking, Equivalent Joint Distress, Equivalent Faulting, and Remaining Life) in the requested format to feed the Priority Formula.	M		
3.3.1	Generate Remaining Pavement Life Attribute	The solution must generate the remaining pavement life based on the pavement condition data, deterioration models, and Priority Formula selected segmentation (the current process is a Monte Carlo Simulation methodology).	M		
3.3.2	Generate "Stoppers" and pass to Priority Formula	The solution is expected to generate vertical curvature stopping site distances in a format that can be passed to the Priority Formula.	E		
3.3.3	Allow for flexibility in Priority Formula Attributes and Segmentation	The solution is expected to allow the user to change attributes to pass to the Priority Formula and use different segmentations (tenth mile, nominally 1-mile pavement management segments, ...) to meet Priority Formula needs.	E		
3.4	Accommodate future expansion of Pavement Management coverage	The solution is expected to accommodate expansion like ramps, individual lanes, shoulders, sidewalks, ... and the ability to expand also includes the need to have condition, modeling, actions, costs, ... capabilities as well. [Note on Lanes: the current pavement management system uses the field lane throughout where 0 means the road is undivided, 1 is for West Bound, 2 is NB, 3 is EB, and 4 is SB, at some point KDOT will need to reconsider what "lanes" means and determine how they will be coded.]	E		
4	**KDOT and Federal Pavement Performance Monitoring Processes**				

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4.1	Flow and track HPMS (pavement) data for submittals	The solution must flow and track the process while generating the pavement components of the Highway Performance Monitoring System as the data is collected, processed, summarized, and submitted to Transportation Planning for the annual submittals.	M		
4.1.1	Compile pavement condition data following HPMS requirements and pass to KDOT Transportation Planning	The solution must generate the HPMS mandated pavement data items (Roughness, Rutting, Faulting, and Percent Cracking) using 0.1 mile aggregation and following all other HPMS edicts and provide that data to KDOT Transportation Planning. NOTE: this data pass could be a very simple interface or workflow.	M		
4.1.1.1	Conflation to Planning Network/LRS	The solution must perform or accommodate a conflation process to align the data following the KDOT PMS Centerline LRS to the Transportation Planning Carriageway LRS using GPS data before aggregating the data to 0.1 mile segments. NOTE: this process may take place within the data collection processing activity, but if it does not occur there, then it must be addressed before data is generated for Transportation Planning.	M		
4.1.1.2	Generate pre-HPMS submittal Report Card	The solution is expected to be able to generate the HPMS Report Card using the compiled but not yet submitted measured KDOT pavement condition data.	E		
4.1.1.3	Interstate data collected in one calendar year must be passed to Planning before April 15 of the following year	The solution must annually generate and provide the HPMS mandated pavement data for the Interstate in time for KDOT Transportation Planning to meet their April 15 submittal deadline.	M		
4.1.1.4	Non-Interstate data collected in one calendar year must be passed to Planning before June 15 of the following year	The solution must annually generate and provide the HPMS mandated pavement data for the Non-Interstate in time for KDOT Transportation Planning to meet their June 15 submittal deadline.	M		
4.1.1.5	Non-State-maintained data collected in one calendar year must be passed to Planning before June 15 of the following year	The solution must annually generate and provide the HPMS mandated pavement data for the Non-state samples in time for KDOT Transportation Planning to meet their June 15 submittal deadline.	M		
4.2	Flow and track predicted pavement condition data for KDOT Performance Measures Dashboard submittals	The solution must flow and track the process to generate the pavement components of the KDOT Performance Measures Dashboard related to predicted pavement condition annually.	M		

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4.2.1	Run analyses to determine predicted pavement performance measure	The solution must complete an analysis that processes the inputs like those described under requirements 2 and 3 to generate the predicted pavement condition as defined by KDOT to perform this function annually [Note that the "future" conditions in these cases might be only a function of deterioration and already scheduled projects.] and provide that data to the KDOT Performance Measures Dashboard. NOTE: this data pass could be a very simple interface or workflow.	M		
4.3	Flow and track pavement condition data for KDOT Performance Measures Dashboard submittals	The solution must flow and track the process to generate the pavement components of the KDOT Performance Measures Dashboard related to measured pavement condition annually.	M		
4.3.1	Compile pavement condition data following KDOT Performance Measures requirements and pass to KDOT Performance Measures Dashboard	The solution must generate the KDOT defined pavement performance measures (some form of Percent of System in Good/Poor Condition - currently following HPMS with additional Transverse Cracking and Joint Distress variables) using nominally 1 mile segmentation and provide that data to the KDOT Performance Measures Dashboard. NOTE: this data pass could be a very simple interface or workflow.	M		
5	**Pavement Related Asset Management Processes**				
5.1	Flow and track the Transportation Asset Management Plan (TAMP) (pavement) data for submittals	The solution must flow and track the process to generate the pavement components of the TAMP as the data is collected, processed, summarized, and submitted to Transportation Planning for the biannual updates [like the Performance Measures under requirement 4, this requirement has a predicted piece and a measured piece (currently HPMS report card)].	M		
5.1.1	Run analyses to determine relate pavement performance, work types, and funding for the TAMP	The solution must complete an analysis that processes the inputs like those described in sections 2 and 3 to generate the predicted pavement condition as defined by KDOT to provide scenarios on different weightings for work type funding and gaps between desired programs and actual budgets over a 12 year horizon each time that the TAMP is updated.	M		
6	**KDOT Highway Inventory Systems Integration**				
6.1	Interface with KDOT implementation of Roads and Highways called K-Hub	The solution must interface with the KDOT implementation of ESRI Roads and Highways maintained by KDOT Transportation Planning.	M		

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6.1.1	Connect K-Hub to update PMS highway network and LRS	The solution must present a mechanism to connect to KDOT's Inventory System (K-Hub) and the PMS noting that PMS uses a Centerline Network with a defined county-based LRSm and the Inventory system uses a carriageway county-based LRSm. This interface should allow the PMS to read data from K-Hub for reference matching.	M		
6.1.2	Use K-Hub Interface to update PMS inventory data	The solution must preserve the existing functionality of the interface between KDOT's Inventory System (K-Hub) and the PMS. This read/write interface allows data to pass from K-Hub to the PMS to check/update inventory items (traffic, NHS, maintenance responsibility, pavement type, lane widths, shoulder type, shoulder width, etc.).	M		
6.1.3	Connect K-Hub to push PMS pavement condition data	The solution must present a mechanism to connect to KDOT's Inventory System (K-Hub) and the PMS. This interface passes pavement condition data from PMS to K-Hub, specific data variables will need to be determined for the Priority Formula Application (refer to requirement 3).	M		
7	**KDOT GIS Systems Integration**				
7.1	Either provide GIS tools or Interface with KDOT implementation of ArcGIS	The solution must provide GIS tools to meet the remaining requirements under number 7 or interface in such a way with the KDOT implementation of ArcGIS or ArcGIS online called KanPlan that it can perform these functions.	M		
7.1.1	Provide GIS visualizations of the network(s)	The solution is desired to show the different LRS networks together so differences may be visualized.	D		
7.1.2	Provide GIS visualizations showing collection/processing status	The solution must be able to show through GIS where data needs to be collected in the current cycle based on the data collection needs for KDOT project selection, performance monitoring, TAMP and other (pavement design, research, or others with needs).	M		
7.1.2.1	Provide GIS visualizations showing where collected data has completed the processing and loading steps	The solution is desired to show through GIS where data has been processed and entered into the appropriate data table(s).	D		
7.1.3	Provide GIS visualizations showing attributes related to pavement inventory or analysis	The solution must be able to show current attribute data (pavement type, pavement width, traffic, maintenance responsibility, NHS status, Action history, Scheduled projects, ...) using GIS mapping tools.	M		

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7.1.4	Provide GIS visualizations showing condition (or measured output) related to pavement analysis	The solution must be able to show current condition data (roughness, rutting, faulting, ..., transverse cracking, cross slope, texture, joint distress, structural measures, friction measures, ...) using GIS mapping tools.	M		
7.1.4.1	Provide GIS visualizations showing condition changes related to pavement analysis	The solution is desired to show current condition data compared to data from a prior year (deltas) using GIS mapping tools.	D		
7.1.4.2	Provide GIS visualizations showing predicted future condition	The solution is expected to show future, predicted (modeled) condition data using GIS mapping tools.	E		
7.1.4.3	Provide GIS visualizations showing condition vs previously predicted changes related to pavement analysis	The solution is expected to show current condition data compared to data from a prediction (residuals) using GIS mapping tools.	E		
7.1.5	Provide GIS visualizations showing analysis outputs	The solution must be able to show analysis recommendations and output (candidate projects for 1R, heavy preservation, or 3R; crack seal candidates; "friction" candidates; structural analysis assessments; ...) using GIS mapping tools.	M		
7.1.6	Provide mark up and feedback on maps	The solution is desired to provide mark up and feedback options on the maps or through associated forms indicating which candidates are accepted, and any routes that were not candidates that are being recommended anyway.	D		
7.1.7	Provide typical GIS functions	The solution must provide or accomodate typical GIS functions such as allowing the user to select common features for mapping, provide for filtering, provide selection, ...	M		
8	**KDOT Historic Data Integration**				
8.1	Interface or ingest historic pavement condition data	The solution must develop an interface or data conversion process to allow users of the system access to historic pavement condition data. There are about 50 GB of data in existing tables.	M		
8.1.1	Interface or ingest historic pavement core data	The solution is desired to interface or incorporate a data conversion process with historic pavement core data (location, date, bound thicknesses by layer with approximate unbound lengths, condition by layer). Currently KDOT does not have this data in electronic form, but an effort may be made by KDOT to back populate a table with this data and then include it in the solution.	D		

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8.1.2	Interface or ingest historic pavement csv report data	The solution is desired to develop an interface or data conversion process to allow users of the system to access to formatted csv "reports" like those created by Mandli RVW [this is just the means to get LCMS and profile data from the collection system into the PMS]. For each year (2013-2022) this would include about 15 data elements. Reports are run at three different aggregations, so a frames report would have about 2.5 million records. A tenths report would have about 120,000 records, and a segments report would have about 12,000 records. For the non-State HPMS, frames reports would be about 80,000 records with 15 fields, 4,000 and 15 for tenths, and about 300 and 15 for HPMS segments.	D		
8.1.3	Interface or ingest historic pavement FWD data	The solution must develop an interface or data conversion process to allow users of the system to access FWD data [this data currently resides in an Oracle database table]. The data structure is much different than the surface data, so it has its own requirement. For each year (1998-2022) this would include about 25 data elements. This is point data with typical yearly record counts around 40,000. It is more likely to be around 20,000 additional records per year moving forward.	M		
8.1.3.1	Interface or ingest historic pavement TSD data	The solution is desired to interface or incorporate a data conversion process for Traffic Speed Deflectometer data [this data currently resides in Oracle database tables and represents about 1500 miles of single time collection. The data is typically at 100 records per mile and 160 data elements]. We expect to continue to collect around 250 miles of this data in future years.	D		
8.1.4	Interface or ingest historic pavement Joint Distress Collection data	The solution must interface or incorporate a data conversion process for Joint Distress Collection data [this data currently resides in PostgreSQL database tables]. These tables are relatively small with about 250 records and 10 fields in 3 different tables.	M		
8.1.5	Interface or ingest historic pavement surface friction data	The solution must interface or incorporate a data conversion process for Surface Friction (SKID) data.	M		
8.1.5.1	Interface or ingest historic pavement surface friction point data	The solution must interface or incorporate a data conversion process for Surface Friction (SKID) actual skid location data [this data currently resides in an Oracle database table]. For each year (1992-2022) this would include about 27 data elements. This is point data with typical yearly record counts around 5,000.	M		

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8.1.5.2	Interface or ingest historic pavement surface friction expanded data	The solution must interface or incorporate a data conversion process for Surface Friction (SKID) expanded data that was inferred based on the point data and surface history [this data currently resides in an Oracle database table]. For each year (2000-2022 - and some records from before 2000) this would include about 8 data elements. This is nominally 1 mile segment data with typical yearly record counts around 5,000.	M		
8.1.5.3	Interface or ingest historic continuous pavement surface friction data	The solution is desired to interface or incorporate a data conversion process for Continuous Surface Friction (SCRIM) data [this data currently resides in a Oracle database tables and represents 1 collection cycle and about 1000 miles].	D		
8.1.6	Interface or ingest historic flexible pavement surface condition data	The solution must interface or incorporate a data conversion process for historic flexible pavement surface condition data (date collected, rutting, transverse cracking, fatigue cracking, block cracking, ...) [this data currently resides in an Oracle database table]. For each year (1986-2022) this would include about 23 data elements. This is nominally 1 mile segment data with typical yearly record counts around 10,000. In addition to the summary data in the tables described above, there are specific tables for transverse cracking. These tables contain about 1.5 million records per year with 21 columns for 2013 to 2022 years coverage. A summary statistic table for segments has 12000 records per year and 8 columns also for the period 2013 to 2022.	M		
8.1.7	Interface or ingest historic rigid pavement surface condition data	The solution must interface or incorporate a data conversion process for historic rigid pavement surface condition data (date collected, faulting, joint distress, ...) [this data currently resides in an Oracle database table]. For each year (1986-2022) this would include about 23 data elements. This is nominally 1 mile segment data with typical yearly record counts around 1,500.	M		
8.1.8	Interface or ingest historic ride data	The solution must interface or incorporate a data conversion process for historic ride quality data (left wheel path International Roughness Index, right wheel path IRI, "rough IRIL" - meaning worst tenth in nominally 1-mile segment, "rough IRIR", date collected, ...) [this data currently resides in an Oracle database table]. For each year (1986-2022) this would include about 16 data elements. This is nominally 1 mile segment data with typical yearly record counts around 12,000.	M		

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8.1.9	Interface or ingest historic HPMS data	The solution must interface or incorporate a data conversion process for historic HPMS data. These tables mimic the ride, rigid, and flexible tables but are for locations that KDOT does not maintain but must be reported for HPMS. [this data currently resides in Oracle database tables]. For each year (1996-2022) this would include about 30 unique data elements with about 300 records per year.	M		
8.1.10	Interface or ingest historic Remaining Life data	The solution must interface or incorporate a data conversion process for remaining pavement life data (these data reflect simulated estimates of remaining life of each pavement segment computed each year) [this data currently resides in an Oracle database table]. For each year (1986-2022) this would include 6 data elements. This is nominally 1 mile segment data with typical yearly record counts around 12,000.	M		
8.1.11	Interface or ingest historic Mean Texture Depth data	The solution is desired to interface or incorporate a data conversion process for Mean Texture Depth (MTD) data from the collection system into the PMS. For each year (currently only 2014-2015) this includes 15 data elements and about 2.5 million records per year.	D		
8.1.12	Interface or ingest historic CSTATE data	The solution must interface or incorporate a data conversion process for combined pavement condition (CSTATE) data (these data reflect the pavement surface data converted to distress states along with info about planned and last actions for each year) [this data currently resides in an Oracle database table]. For each year (1986-2022) this would include 19 data elements. This is nominally 1 mile segment data with typical yearly record counts around 12,000.	M		
8.1.13	Interface or ingest historic segmented action history data	The solution must interface or incorporate a data conversion process for aggregated and summarized action history and planned work data (ACTHIST) [this data currently resides in an Oracle database table]. This data is current (not historic in the sense of many years). It is aggregated so that routes with the same action history are aggregated together. this would include 30 data elements and about 2000 records. Each year this table gets updated and replaces the prior data.	M		

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8.2	Interface or ingest current inventory data	The solution must interface or incorporate a data conversion process for current (and sometimes historic inventory data). Most of the inventory data is representative of the current state, but where the data is historic, it is all referenced to the current inventory location name.	M		
8.2.1	Interface or ingest current inventory data for the State Highway System - GEOM	The solution must interface or incorporate a data conversion process for inventory data for state maintained segments (GEOM). [this data currently resides in an Oracle database table]. This data reflects the current PMS segments and many attributes related to that segment. The ID field in this table is the key to relating to almost all the other segmented data. It is updated each year with new info replacing the old. This includes about 80 data elements. This is nominally 1 mile segment data with typical yearly record counts around 12,000.	M		
8.2.2	Interface or ingest current inventory data for the Highway Performance Management System - HPMS	The solution must interface or incorporate a data conversion process for inventory data for non-state maintained Highway Performance Management System segments (HPMS). [this data currently resides in an Oracle database table]. This data reflects the current HPMS segments and a few attributes related to that segment. The ID field in this table is the key to relating to almost all the other segmented data. It is updated each year with new info replacing the old. This includes about 16 data elements with typical yearly record counts around 300.	M		
8.2.3	Interface or ingest current inventory data References-REF	The solution must interface or incorporate a data conversion process for reference data (REF). [this data currently resides in an Oracle database table]. This data reflects the points defined by the LRS and verbose descriptions of those points for human reference. It is maintained with new info replacing the old and additional records added as needed. This includes about 12 data elements with about 6500 records.	M		
8.2.4	Interface or ingest current inventory data for historic traffic - TRAF	The solution must interface or incorporate a data conversion process for traffic data for state maintained segments (TRAFFIC). [this data currently resides in an Oracle database table]. This data contains the historic traffic based on the current GEOM IDs. It is appended to each year with new info added to the old. This includes about 6 data elements. This is nominally 1 mile segment data with typical yearly record counts around 12,000.	M		

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8.3	Interface or ingest current data for project tracking for Pavement Management purposes	The solution must interface or incorporate a data conversion process for project tracking information. This is basically a local source of what projects are in the pipeline, which have been completed, and a few details about what will be/was done.	M		
8.3.1	Interface or ingest current data about current or scheduled pavement surfacing projects - PROJECT	The solution must interface or incorporate a data conversion process for project tracking information for current or scheduled pavement surfacing projects. The PROJECT data is used to determine what/where/when for pavement projects on the state highway system. It is only for projects that are currently underway or scheduled in the next 3 years. The table includes about 25 fields and 650 rows.	M		
8.3.2	Interface or ingest current data reported through a form by field personnel indicating that a project is completed - CRF	The solution must interface or incorporate a data conversion process for project tracking information for projects reported as Open. The Completed Rehab Form (CRF) data is provided for each project stating what/where/when for pavement projects on the state highway system once they are open to unrestricted traffic. This table is historic and includes records from 1988 to present. The table includes about 31 fields and over 7000 records and grows by about 200 records per year.	M		
8.4	Interface or ingest NOS collection data from Van and data processing	The solution must interface or incorporate a data conversion process for pavement surface images and data, forward images and data, and other related collection data (profile, features, etc.). This data also goes through some processing that extracts the images and data from the data collection vendor's format into formats that can be used by reporting and viewing software	M		
8.4.1	Interface or ingest native format files (FIS) from pavement surface data collection system.	The solution must interface or incorporate a data conversion process for the pavement surface data collection native files. These are the data collected by the LCMS system in the propreietary vendor format. They account for about 2.6 million files/year and 24TB per year 2013-2022 already exist and are stored locally.	M		
8.4.2	Interface or ingest image files from pavement surface data collection system.	The solution must interface or incorporate a data conversion process for the pavement surface data collection image files. These represent about 38 million files/year and 11TB per year 2013-2022.	M		

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8.5	Interface or ingest GPS data tied to the collection process and LRS.	The solution must interface or incorporate a data conversion process for GPS data that is tied to the data collection process and LRS. Some of this data is currently in the pmis.gps table and is from 1998-2012 at about 700,000 records per year and 26 fields. For 2013-2022, the data is about 2.5million records per year but only 7 fields.	M		
8.6	Other Miscellaneous Data	Note that this list of historic data may not be exhaustive and that respondants should indicate if they have a limit to the numbers of tables, table sizes, or storage limits included in their bid so that it does not become a point of contention during implementation.			
9	**Pavement Condition Collection Systems and Data Integration**				
9.1	Interface with KDOT (and other typical) pavement condition collection systems	The solution is expected to interface with KDOT and other typical pavement condition collection systems (Mandli implementation of SD-type profiler, LCMS I, LCMS II; KDOT specific Joint Distress (WhiPavSur); KDOT SKID; TSD; KDOT cores; KDOT Transverse Cracking; lcms cross slope; lcms texture; SCRIM, ... each of these systems is further defined in the Glossary) as the means to incorporate data collected in the future more directly into the system.	E		
9.1.1	Comprehensive process from collection through analysis	The solution is expected to help make the collection, processing, loading, and analyzing processes comprehensive and well managed from beginning to end.	E		
9.1.1.1	Where to collect	The solution is expected to use the networks and collection rules to help determine and document with lists and/or maps where [specific types of] data are needed in the next collection cycle.	E		
9.1.1.2	What has been collected/what remains	The solution is desired to use the networks and collection tracking to determine and document with lists and/or maps where [specific types] of data have/still need to be collected.	D		
9.1.1.3	Data Quality Checks	The solution is desired to follow KDOT specified quality checks for each data collection activity and must provide relevant documentation (ex: DQMP is a federal report) of these checks.	D		
9.2	Interface with KDOT (or other commercial) pavement condition image viewing and reporting systems (NCV)	The solution shall preserve the existing functionality of the interface between the PMS and NCV. This interface sends PMS pavement image and condition (video log with pavement data) and all the necessary data to feed it that currently comes from stored images and many tables of data to NCV.	M		

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10	**Project Management Systems Integration**				
10.1	Interface with KDOT project management systems	The solution is expected to interface with the KDOT project management system (WinCPMS) as the means to incorporate project information (scheduled and let projects, locations, scopes, schedule, costs, and project number) into the system.	E		
10.2	Use or replace CRF web app to get project "actuals" from field personnel	The solution shall preserve the existing functionality of the interface between the Completed Rehab Form (CRF) web app and the PMS. This interface passes data from the CRF web app to PMS and helps track which projects are expected for completion in the calendar year and then to get the actual location, scope, open to unrestricted traffic date, mix, layer thicknesses, rumble strip, and shoulder information about the project into the system.	M		
10.2.1	Alert Transportation Planning of completed CRFs	The solution is expected to provide workflow notification or a tracking tool to alert Transportation Planning when each Completed Rehab Form is submitted so the K-Hub process for extracting and updating inventory information changed by the project can be completed.	E		
11	**Managing Pavement Reporting Functions**				
11.1	Report Functionality	The solution must provide appropriate tools to generate, search, filter, view, modify, distribute, delete, ... reports [a list of reports is provided in the Reports Tab].	M		
11.2	Report Data	The solution must accommodate a wide range of reports spanning those that are simply pulling and displaying data (KTA report, rutting, "1R" tour review, ...) to in some cases doing some analysis to get to the data needed (Annual Report, IKE dashboard, State Performance Measures Dashboard, GASB, ...).	M		
12	**Pavement Data and Analysis with Relevant Systems Integration**				
12.1	Interface Functionality	The solution must provide interfaces of various levels of complexity as described under other specific requirements [a list of interfaces is provided in the Interfaces Tab].	M		
13	**Configuration**				
13.1	System Configurability	The solution must allow for configurations that allow KDOT to tailor the system to best meet our needs and to allow for future modifications [a configuration draft document is being developed by KDOT and will be available early in the implementation stage of the project].	M		

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13.1.1	Mobile Support	The solution is desired to be accessible at least for appropriate field information for mobile devices and tablets.	D		
13.1.2	External Reporting and Analysis tool support	The solution is desired to be able to incorporate analysis and reporting tools (PowerBI, Crystal Reports, Tableau, ...).	D		
14	**Forms**				
14.1	Forms Functionality	The solution must provide forms of various levels of complexity as described under other specific requirements [a list of forms is provided in the Forms Tab].	M		
15	**Workflow**				
15.1	Workflow Functionality	The solution must provide workflows to help streamline processes and keep users informed of progress and relevant tasks as described under other specific requirements [a list of sample workflows is provided in the Workflows Tab].	M		
16	**Technical Architecture**				
16.1	Operating System	If the solution includes a client installation, the solution shall be able to run in Windows 10 OS or a later version and/or in a Windows 10/11 compatible browser or higher version (see Browser Capability below) for a web-based system.	M		
16.2	Client Environments	The solution shall be compatible with KDOT's computing environment which includes, but is not limited to: Microsoft Office 365 SP 1 (64-bit), MS Office 2016 & Microsoft Outlook Exchange 365 & InfoPath 2013 , and Sophos Antivirus. NOTE: Only applies for client based solution.	M		
16.3	Browser Capability	The solution shall be compatible with the minimum listed or higher versions of the following browsers: Microsoft Edge 106, Firefox 56, Safari, and Chrome 61. (Chrome preferred)	M		
16.4	SOA Architecture	The solution shall utilize Web Services for data exchanges between Applications following a Service Oriented Architecture (SOA) model.	E		
16.5	SOA Architecture	The solution shall utilize API for data exchanges between Applications following a Service Oriented Architecture (SOA) model.	M		
16.6	Oracle or SQL Server Management	The solution shall utilize Oracle 19 or newer or SQL Server 2016 or newer along with SQL Server Management Studio v19.1 or newer for managing the SQL Server. (Oracle preferred) NOTE: Only applies to client hosted solution.	M		

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16.7	Windows Server	Any local solution shall utilize Microsoft Windows Server 2019 or higher, or whichever is most appropriate at the time of award. NOTE: Only applies to client hosted solution.	M		
16.8	Communication Bandwidth	The solution shall utilize a high-performance, high-bandwidth network to meet its communication requirement.	E		
16.9	Architecture	The solution shall be deployed in a secured cloud infrastructure. NOTE: Only applies to vendor hosted solution.	M		
16.10	Documentation	The selected solution responder shall provide software, tools, web services, sample code, interface control documents (ICD) or other schemas in sufficient detail to enable KDOT to integrate future technologies, including but not limited to AVL, GPS or RFID systems.	M		
16.11	User Documentation	The selected solution responder shall provide electronic user documentation. The documentation should be sufficient that users can perform the regular functions to produce the desired reports, appropriately input (individually or in bulk) relevant data and parameters, efficiently interface with other systems to exchange data, and manage the various processes related to running a PMS.	M		
17	**Security Requirements**				
17.1	State Security Policy	The solution shall comply with Kansas Information Technology Office security policies. (See 7000 Series - Security; found at: https://oits.ks.gov/kito/itec/itec-policies)	M		
17.2	AD Authentication	Utilizing Active Directory, the solution shall use single sign-on to allow authorized KDOT staff to access their roles through existing username and password.	M		
17.3	Active Directory Integration	The system shall, at a minimum, be compatible with Active Directory Federation Service 3, although compatibility with ADFS 4 would be strongly preferred.	M		
17.4	AD Configuration	The system shall provide full ADFS configuration, including metadata exchange.	M		
17.5	Multiple Users	The solution shall support login by multiple users simultaneously, each with their own username and password.	M		
17.6	Single Sign on	The solution shall allow users to log in to the system using their Active Directory account information. It shall also support SAML2, Oauth and other modern SSO authentication methods.	M		

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17.7	Accessibility--1	The system shall have a W3C and 508 Compliant Interface.	M		
17.8	Accessibility--2	The system shall comply with State of Kansas standards for accessibility by people with disabilities as outlined the State of Kansas Web Accessibility Requirements. Refer to the following website for more information: https://ebit.ks.gov/itec/resources/policies/policy-1210	M		
17.9	Automated User Access List updates	The system shall have the ability to load user list via encrypted file batch process or through encrypted services.	E		
17.10	Authorization level	The solution shall support multiple user authorization levels, each with a unique set of activities that can be performed by the users.	M		
17.11	Multiple User Groups	The solution shall be able to define several user groups.	M		
17.12	Member of User Groups	The solution shall allow nested user groups, i.e., one user group may be member or subset of another user group.	M		
17.13	User Group Security Access	The solution shall be able to provide different security access for each user group.	M		
17.14	Default User Group	The solution shall be able to assign each user account to a default user group.	M		
17.15	Group Configuration	The solution shall have the ability to configure access, menus, and window views based on user group.	M		
17.16	Restrict Access	The solution shall restrict access by role to protect against fraud and error. This includes transaction and data set protection. Users should only be able to access screens or fields to which they have been granted access rights.	M		
17.17	Least privilege	Application will use non-administrative accounts to access the database.	M		
17.18	Default Local Accounts	System must support changing default passwords or disabling of default local accounts (root, admin, sa).	M		
17.19	Session management	The revealing of session tokens in URL parameters or error messages is prohibited.	M		
17.2	Session Termination-Manual Lo	Applications must provide the ability to manually log off of the application.	M		
17.21	Session Termination-Inactivity I	Sessions will time out and terminates a connection after a period of 30 minutes of inactivity or at the end of a session.	M		
17.22	User Timeout	The system shall automatically time out after user defined time of inactivity. Inactivity is defined as no user interaction with the system.	M		

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17.23	Security Authentication and Authorization	The solution shall provide security authentication and authorization mechanisms including but not limited to an authentication framework that secures both web based access and web services, a web service authentication utilizing same authentication scheme, but extended for web services etc.	M		
17.24	Logging Security Violations	The solution shall keep a log of information related to the processes attempted to violate the security protocol including but not limited to the Denial of Service (DOS) attacks, repeated failed log-ins, attempts to insert malicious code, cross-scripting attempts, etc.. The information of such a security violating process that need to be stored shall be defined in the solution design document.	M		
17.25	Denial of Service	The solution shall automatically block IP addresses of the processes that attempt to violate the solution security protocol including but not limited to the Denial of Service (DOS) attacks, repeated failed log-ins, attempts to insert malicious code, cross-scripting attempts etc.	M		
17.26	Data Encryption	The system shall use a SHA2 256 bit or better encryption algorithm.	M		
17.27	Data Privacy	The solution shall provide the ability to transmit all data in a secure manner. All data should be encrypted both at rest and in transit.	M		
17.28	Data Segregation	System data shall be housed in the continental United States. All KDOT data should be segregated from other customer data to prevent unspecified actions towards these other customers adversely affecting KDOT data.	M		
17.29	History Tracking	The system shall keep a log of all changes made to data within the system. The log should contain who made the change, the date the change was made, and a brief description of what was changed. This log should be designed for efficiency so that batch operations are not negatively impacted by the logging function.	M		
18	**Disaster Recovery**				
18.1	Data Protection and Recovery	For a hosted system, the vendor shall supply KDOT with its backup and disaster recovery policies and procedures. These procedures should provide an efficient data protection and recovery plan that would quickly recover system data.	E		
19	**System Hardware (KDOT Hosted)**				

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19.1	Hardware Requirements (KDOT Hosted)	If KDOT determines self or third-party hosting is the appropriate solution, the vendor shall provide details of hardware required to operate the system. These details should include but are not limited to the number of servers, the role of each (DB, IIS, application, backup), server type (physical, virtual), and storage type as well as any other hardware or other environmental requirements for the proposed solution (RAM, processing power, etc.).	E		
19.2	Estimated cost of equipment/ hardware (KDOT Hosted)	If KDOT determines self or third-party hosting is the appropriate solution, the vendor shall provide an estimate of costs required to purchase, install, and configure the required hardware per SYH-1 above.	E		
20	**Data Integrity**				
20.1	Master Requirement for routine data integrity	The system needs to allow for users to import data by manual entry or through uploads that check the data validity, but don't require users to suspend application integrity checks or toggle table dependencies each time.	M		

Name	Description and usage	Complexity	Specific Req
Field Data Collection List (FDCL)	This is a paper book produced annually that includes PMS segmentation and county mileposts, pavement type, percent predominant pavement type, and location references (NJct U54/K15 15.234 which comes from a manually maintained Reference table). It is used by field data collectors, PMS data users, and many people just for the references.	Medium	9.1.1.1 and 9.1.1.2
Projects (outstanding, submitted, future)	This is a dataset that is constantly maintained that sometimes takes the form of reports, interfaces, forms, and even workflows. The data represents tracking of pavement projects from the time they are candidates, to district selections, to 1R (or other program) selections, to "real" projects (have a number assigned), to let projects, to "open to unrestricted traffic" .... The formats of these reports vary by different users and uses. Note that the data behind these reports comes from many different sources (1R Candidates, District Selections, WinCPMS, Letting Lists, Completed Rehab Form submissions, ... They are used by the project selection processes (1R and 3R), CRF, many of the mapping reports, and Transportation Planning as they update their pavement histories.	High (lots of sources to get to this data)	10.2 and 10.2.1
Data Collection Maps	This set of GIS maps shows shows the inventory locations to be collected for LCMS/NOS, WHIPAVSAUR, FWD, SKID... vs what has been collected in the current cycle. Basically, this report is showing data collection progress.	Medium	7.1.2
Data Loaded Maps	This set of GIS maps shows where collected data has been loaded to the appropriate PMS data tables over the inventory as a back drop. Basically, this report is showing data loading progress.	Medium	7.1.2.1
Candidate Project Lists and Maps	This paper report or dataset (or workflow) which is the results of PMS analysis that indicates candidate project locations and scopes for each of the 6 districts for their consideration	High (lots of sources to get to this data)	7.1.5 and 7.1.6
District Selection	This (typically comes back as an email with a spreadsheet attachment and) is the district response to the candidate lists that indicates which projects and scopes they selected including the possibility of projects that were not on the candidate list	High (lots of sources to get to this data)	7.1.5 and 7.1.6

Name	Description and usage	Complexity	Specific Req
Approved for 402s	This is (typically an email with a spreadsheet attachment and is) the response to the district response that indicates approval by the Chief of Construction and Materials to projects and scopes for a district for a cycle	Low	3.1 see also (7.1.5, 7.1.6, and 11.1)
Candidate Maps	This is a paper map based on the 1R process to show candidate project locations and scheduled projects in each district. They are used by District Staff to help them decide which 1R projects to do in their next cycle.	High (lots of sources to get to this data)	7.1.5
Action History Table and Maps	This is a paper report and a process that results in a database table that summarizes contiguous roadway segments annually with candidate information, planned project information, past project information, ...	Medium	7.1.3
Pavement Sandwiches	This can be a paper report or dataset (or interface) and represents a section of roadway and both its action history in the form of what was done when and in the form of what physical pavements exist there now	High (mostly due to aggregation rules and precision concerns)	7.1.3
Condition Reports (Annual, IKE, State PM dashboard, others?)	These may be paper reports or datasets (or workflows) that simply provide some aggregation of pavement condition data or predicted condition data or work types and amounts accomplished or scheduled to other parts of the Agency	Medium	11.2
Condition Maps (Roughness, Rutting, Faulting, Transverse Cracking, Joint Distress, Pavement Type, SKID, FWD, Surface Age, ...)	These typically are paper maps showing various pavement condition information	Low	7.1.4
DQMP Check	This is a paper report that follows the Kansas Pavement Condition Data Collection Quality Management Plan to produce an annual report documenting the quality of the collected data	Medium	9.1.1.3
KTA data	This can be a paper book or dataset (or interface) produced annually that provides pavement condition data collected by KDOT but for the KTA (and HPMS). It includes roughness, rutting, and faulting following KDOT methods and could include more PMS condition data (transverse cracking, structural data, SKID, ...) . It is used by KTA for input into their PMS and reports.	Low	11.2

Name	Description and usage	Complexity	Specific Req
SKID book	This is a paper book generated mostly to facilitate field data collection. The current process to generate this book also creates unique IDs and data record placeholders in existing tables. The book is used by field data collectors to determine where they need to gather friction data.	Medium	9.1 and 9.1.1.2
SKID map	This is a paper map based on the SKID book to show locations that need to be collected along with some additional details like where projects have just been completed and where there might be construction pending.	Low	9.1.1.1 See also 7.x
FWD map	This is a paper map showing locations to collect FWD based on a list generated by Pavement Evaluation staff.	Low	9.1.1.1
HPMS report card	This is a paper report following FHWA guidance that uses the HPMS submittal data to check pavement data and summarize condition. The official version of this report will come back from FHWA software, but this version needs to use data in the PMS so that we know the answers before we go through the submittal process.	Medium	4.1.1.2
Mandli data reports to move from XML and profile to the PMS database	These datasets are the current means of taking the processed LCMS data and using Mandli's Road View Workstation tools to assemble it into attributes (roughness, rutting, faulting, (various forms of) cracking, ...) at various aggregations (frame, tenths, segments, projects, ...) for import into data tables each year.	High	9.1.1
DS, CS, PL, report summaries for feeding GASB, TAMP, ACFR, PMs, Auditors, Annual Report)	These may be paper reports or datasets (or workflows) that provide pavement condition data in the forms of Distress State, Condition State, and Performance Level distributions to other parts of the Agency mostly as detail to the more aggregated summaries reported elsewhere	Low	5.1 for TAMP and 11.2 for all others
Widows and Orphans	This can be a paper report or dataset (or interface or workflow) produced regularly (weekly?) that provides analysis of referential integrity (e.g. inventory record with no condition data or vice versa), internal checks (e.g. components of PMSID concat correctly into the PMSID), and logical checks (e.g. scheduled projects have future not past dates). It is used by PMS staff to check the database.	Medium	21

Name	Description and usage	Complexity	Specific Req
District Mileage Allotments	This can be a paper report or dataset (or interface or workflow) produced annually as part of the 1R process. It represents the number of miles allocated to each district to target as they select projects from the candidate project lists. Historically, rules have been applied to assign minimum proportions of the projects selected from different categories versus this district total. Those rules helped keep the PMS output and the implementation of projects somewhat in sync. The mileages are used by the Districts when selecting projects and by PMS to check proportions and totals for projects which get selected by each district.	High (lots of process to get to this data)	3.1
1R Tour Supplemental Data	This is typically a dataset that summarizes pavement history, traffic, pavement width, NHS, ... for candidate project locations for the field reviews	Low	11.1
Additional Reports	Note that this list of reports is not exhaustive and that respondants should indicate if they have a limit to the numbers of reports included in their bid so that it does not become a point of contention during implementation.	Varies	11.2

Description and usage	Complexity	Specific Req
This is the connection between KDOT's PMS and KDOT's Inventory system network noting that PMS uses a Centerline Network with a defined county-based LRSm and the Inventory system uses a carriageway county-based LRSm	High (the standard will be KDOTs arbitrary definition of "close enough")	6.1. & 6.1.1
This is the connection between KDOT's PMS and KDOT's Inventory system specifically to pass data from the inventory system to PMS likely using the two different (but close) networks	Medium (pulling data from someone else)	6.1.2
This is the connection between KDOT's PMS and KDOT's Inventory system specifically to pass HPMS pavement condition data from PMS to the inventory system	Low (passing data to someone else)	4.1.1 and 6.1.3
This can be a paper report or dataset (or interface or workflow) produced annually as part of the HPMS process. The data is collected by KDOT PMS forces despite it being for locations that are not KDOT ownership nor maintenance responsibility. Transportation Planning provides descriptions of the locations where data is required. PMS collects the data and then provides it back to Planning as unconflated pavement condition data following HPMS rules	Low (passing data to someone else)	4.1.1.5

Description and usage	Complexity	Specific Req
This is the connection between KDOT's PMS and KDOT's Inventory system specifically to pass Priority Formula pavement condition data from PMS to the inventory system	Low (passing data to someone else)	3.3. & 6.1.3
The proposed solution is expected to provide map-based UIs and reports so that users can see and edit data in map views. If the GIS is native to the solution, that is fine. If the proposed solution will use an external interface for this functionality, KDOT uses ArcGIS and a KDOT specific ArcGIS platform called KanPlan.	Medium (this is probably a pretty standard connection between data and mapping tools, just everyone's implemetation has a few quirks).	7.1.
This is the connection (possibly a workflow) between KDOT's PMS and KDOT's Inventory system specifically to pass completed project information from PMS (actually from the CRF process) to the inventory system	Low (passing data to someone else)	10.2.1
This is the connection (currently a webform) to manage responses from field personnel and get completed project information	High (uses a number of sources and requires external folks to provide data to PMS)	10.2
This is the connection between KDOT PMS's pavement image and condition (think video log with pavement data) and all the necessary data to feed it that currently comes from stored images and many tables of data	High (lots of pieces have to come together to feed this system in real time to function as the viewer we are used to)	9.2

Description and usage	Complexity	Specific Req
This is a future connection between KDOT PMS condition data and/or analysis and KDOT Performance Measure Dashboards	Low (passing data to someone else)	4.2 & 4.3 & 11.2
This is a future possible connection that shortcuts many of the steps currently involved in the processing of pavement condition data by using directly (or more directly) the outputs from the collection systems instead of requiring intermediate steps to generate data for and population of database tables (direct from XML or maybe direct from shapefiles)	High (requires understanding raw or partially compiled pavement data and procedures to convert the data into pavement condition items like roughness, rutting, faulting, cracking, ..., involves some form of location info, many pieces and parts)	9.1. & 9.1.1
This is the connection between KDOT PMS developed application to collect joint distress data and storing that data	Low (existing process is straight forward just needs to get some info about where to collect to the external system and bring the data back in once it is collected)	9.1
This may be a report only, but it could be an interface that accesses the pavement condition data prescribed in the DQMP for the annual check and helps walk users through performing the checks and generating the report(s)	Medium (as an interface, this simply walks people through the escalating tiers of checking the pavement condition data)	9.1.1.3

Description and usage	Complexity	Specific Req
This may be a report only, but it could be an interface to allow the Kansas Turnpike Authority to access the pavement condition data collected by KDOT on the KTA directly	Low (passing data to someone else)	11.2
This may be a bit of a placeholder, but KDOT PMS data collection systems may act more like separate systems that need to have interfaces to the primary PMS application. If so, then this represents the link between our pavement condition collection system (LCMS) and the Mandli Roadview Workstation tools that convert that standard Pavemetrics data into HPMS and KDOT specific elements (like IRI, rutting, ...)	Medium (as an interface or possibly workflow, this is just moving data and users through the process)	9.1
This is a future possible connection between KDOT WinCPMS (the project management system) and KDOT PMS so that the PMS system can track scheduled projects and as a source for project costs	High (getting data from another system that doesn't play nicely)	10.1
This is a future possible connection between KDOT (whatever now holds crash data) and KDOT PMS so that the PMS can use accident information in pavement surface decisions.	High (getting data from another system that isn't known to PMS)	6.1 (maybe)

Description and usage	Complexity	Specific Req
This may be a bit of a placeholder, but KDOT PMS data collection systems may act more like separate systems that need to have interfaces to the primary PMS application. If so, then this represents the link between our pavement surface friction system and PMS	Medium (as an interface or possibly workflow, this is just moving data and users through the process)	8.1.5 & 9.1.1
This may be a bit of a placeholder, but KDOT PMS data collection systems may act more like separate systems that need to have interfaces to the primary PMS application. If so, then this represents the link between our pavement structural Falling Weight Deflection system and PMS	Medium (as an interface or possibly workflow, this is just moving data and users through the process)	9.1.1

Name	Description and usage	Complexity	Specific Req
Historical Pavement Condition Data	KDOT has collected and maintained historical pavement condition data since the 1980s. Some of this data might still be relevant for model development. This data may continue to be stored in KDOT repositories and accessed as needed by the proposed solution or may be ingested, stored, and made available through the proposed solution. The Historic Data Tab contains specifics about the existing historic pavement condition data tables.	Medium - lots of data and tables	8.1

Name	Description and usage	Complexity	Specific Req
Field->PMS - Completed Rehab Form (FORM)	This is the connection (currently a webform) to manage responses from field personnel and get completed project information	High (uses a number of sources and requires external folks to provide data to PMS)	10.2
Additional Forms	Note that this single form listed may not be the only form, so respondents should indicate if they have a limit to the numbers of forms included in their bid so that it does not become a point of contention during implementation.	Varies	14.1

Name	Description and usage	Complexity	Specific Req
Field->PMS - Completed Rehab Form (FORM)	This is the connection (currently a webform) to manage responses from field personnel and get completed project information, but it could take on elements of a workflow to alert people of entries or need for information type steps	High (uses a number of sources and requires external folks to provide data to PMS)	10.2
Reporting Completed Project Entries to Transportation Planning	As indicated in Forms, the Complete Rehab Form has elements that would benefit from workflows like an alert from KDOT's PMS to KDOT's Inventory system specifically to pass completed project information from PMS (actually from the CRF process) to the inventory system	Low (passing data to someone else)	10.2.1
1R Review Process	This process runs through the selection of candidate 1R projects by the PMS, sends them to the districts for consideration and selection, then a field review takes place with tentative location and scope selection, followed by a budget check, approval to move forward with 402s (plans), development of plans, and then it is turned over to the Agency Project Management System. So, a workflow may help manage the projects through the selection process	High (lots of sources to get to this data)	7.1.5 and 7.1.6
Condition Reports (Annual, IKE, State PM dashboard, others?)	Workflows are envisioned to pass data or document passing data to various entities like the folks running the KDOT Performance Measures Dashboard and other reporting tools	Medium	11.2
Additional Workflows	Note that the workflows listed are examples and when the system capabilities are better understood, we may have more logical places to implement workflows, so respondents should indicate if they have a limit to the numbers of workflows included in their bid so that it does not become a point of contention during implementation.	Varies	14.1

TABLE_NAME/FILE_EXTENSIONS	Data about	Records	Years	Data Elements (# of Fields)	Grows Annually Records/Files	Req Reference
COST TABLES	Action Unit Costs	5,000	current	13	not much	8.6.
PROJECT	active inputs	650	current	23	not much	8.3.1
AVGSKID	Condition	122,000	-2022	8	5,000	8.1.5.2
CSTATE	Condition	372,000	1986-2021	19	12,000	8.1.12
FDIST	Condition	361,000	1986-2022	23	12,000	8.1.6
FWD	Condition	840,000	1998-2021	24	15,000	8.1.3
HFDIST	Condition	2,500	1996-2022	23	200	8.1.6
HRDIST	Condition	1,000	1996-2022	23	80	8.1.7
HROUGH	Condition	3,600	1996-2022	16	295	8.1.8
LCMSFRAMEHPMSNON	Condition	650,000	2013-2021	20	70,000	8.1.
LCMSFRAMEHPMSST	Condition	24,000,000	2013-2022	20	2,500,000	8.1.
LCMSTRANSCRACKS	Condition	13,000,000	2013-2022	21	1,300,000	8.1.6
MTDS	Condition	5,000,000	2014-2015	15	2,500,000	8.1.11
RDIST	Condition	65,000	1986-2022	23	1,200	8.1.7
REMLIFE	Condition	360,000	1986-2021	6	12,000	8.1.10
ROUGH	Condition	400,000	1986-2022	16	12,000	8.1.8
SKID	Condition	158,000	1992-2021	27	5,000	8.1.5.1
CRF	historical input	7,200	1986-2022	31	200	8.3.2
LMA	historical input	69,000	-2021	17	2,000	8.1.13
REHAB	historical input	196	current	14	not much	8.6.
GEOM	Inventory	11,847	current	82	not much	8.2.1
GPS	Inventory	21,000,000	1998-2019	26	2,100,000	8.5.
HPMS	Inventory	295	current	16	not much	8.2.2
HPMS_GPS	Inventory	297	current	20	not much	8.2.
MASTERID	Inventory	12,142	current	28	not much	8.2.
REF	Inventory	6,500	current	12	not much	8.2.3
REFPOST	Inventory	62,000	-2010	10	not much, but needs update	8.2.
TRAFFIC	Inventory	340,000	1987-2022	6	12,000	8.2.4
ACTHIST	inventory/stored report	1,950	current	29	not much	8.1.13
GPSLRS	inventory/stored report	1,400,000	a year?	11	not much	8.5.
File Extensions:						
FIS	Raw	24 TB /year	2013-2022		2600000 files/year	8.4.1
Images	Raw	11 TB /year	2013-2022		11000000 files/year	8.4.2