General Aviation Data Improvement Team (GADIT)



ACCIDENT-DATA TASK REPORT

AUGUST 2002

GADIT Accident-Data Task Report

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GENERAL AVIATION DATA IMPROVEMENT TEAM (GADIT) ACCIDENT-DATA TASK REPORT

EXECUTIVE SUMMARY

In 1998 and 1999, under the FAA's Safer Skies initiative, teams of government and industry experts reviewed general aviation accidents stemming from weather and controlled flight into terrain, and recommended equipment, education, training and procedural changes that would prevent these types of accidents in the future. These recommendations are now being implemented. However, these teams reported that their analyses were often hindered by a lack of sufficient detail about the factors leading-up to an accident.

Because of these concerns, in April of 2000 the General Aviation Joint Steering Committee (GA-JSC) commissioned the General Aviation Data Improvement Team (GADIT) to suggest ways of improving: (1) Activity Data; (2) Accident Data; (3) Incident Data; and (4) Safety Metrics. This report, addressing ways to improve general aviation accident data, is the GADIT's second report. Work began on the Accident Data task in June 2001, and was completed in August, 2002.

The GADIT considered 74 possible solutions for accident data problems, with priority given to solutions addressing better general aviation accident data in the areas of controlled flight into terrain, weather, aeronautical decision making, runway incursions and survivability. Each possible solution was evaluated for its effectiveness and feasibility. The GADIT's final recommendations fall into eight areas:

- Standardize Accident Information
- Improve Quality and Completeness of Accident Records
- Link the Accident Database to Other Aviation Safety Database
- Improve Accident Data Accessibility for Research and Analysis
- Improve Accident Investigator Training
- Formalize Criteria for Initiating NTSB Field Investigations
- Increase Resources for General Aviation Accident Investigations
- Develop Low Cost Airborne Data Recorders

Details of these recommendations are summarized on page 22.

INTRODUCTION

In the spring of 1998, the Federal Aviation Administration (FAA) initiated the "Safer Skies Agenda". This program, a partnership with the aviation community, uses a data-driven approach to analyzing aviation accidents in key areas, and recommends specific interventions to reduce general aviation (GA) and commercial (airline) accidents.

The Safer Skies efforts related to general aviation are undertaken by the General Aviation Joint Steering Committee (GA-JSC), which is co-chaired by the National Business Aviation Association and the FAA, and includes industry representatives from the Aircraft Owners and Pilots Association (including the Air Safety Foundation), the Experimental Aircraft Association, the General Aviation Manufacturers Association, the Helicopter Association International, the National Air Transport Association, and others. Government representatives on the GA-JSC include FAA representatives from Aircraft Certification, Flight Standards and Air Traffic. The GA-JSC ensures that appropriate subject matter experts from their respective organizations participate in various teams formed to undertake general aviation accident analysis and develop intervention strategies.

Through August of 2002, Safer Skies teams have analyzed general aviation weather and controlled flight into terrain accidents and incidents, and recommended many intervention strategies. In addition, a government/industry team of experts analyzed several years of data for general aviation accidents related to aeronautical decision making, and will soon begin developing intervention strategies.

All three of these teams identified areas where additional details about certain types of general aviation accidents and incidents would have improved their ability to develop interventions. For instance, in its final report on Controlled Flight into Terrain (CFIT) interventions, the Joint Safety Implementation Team (JSIT) stated:

> "The team also recommends improving the investigation and reporting of GA mishaps; especially the human factors aspects. Accurate determination of the root causes of GA mishaps will provide a rich source of information for future data-driven processes."

In some cases, this accident information may already be part of the National Transportation Safety Board's (NTSB) detailed accident reports, but it is not easily accessed because it is not in a format that lends itself to efficient comparisons of a large number of accidents.

Because of these concerns, in April of 2000 the GS-JSC commissioned the General Aviation Data Improvement Team (GADIT). The Charter for the GADIT (see Appendix C) called for the NTSB, FAA, and an industry representative to be Co-Chairs. The remainder of the team would consist of appropriate government and industry representatives (see Appendix D). The Charter specified that the GADIT would develop implementation strategies to: (1) Increase detail about factors that have contributed to or caused general aviation accidents and incidents; (2) Improve the quality and timeliness of estimates of general aviation activity and; (3) Suggest alternative and innovative ways to measure the effectiveness of "Safer Skies" interventions for general aviation.

It was agreed that the work of the GADIT should be broken into four task areas: (1) Activity Data; (2) Accident Data; (3) Incident Data; and (4) Metrics. It was also specified that the task would be conducted sequentially, with each task taking from six to nine months to complete. At the end of each task, a report would be submitted to the GADIT and to the JSC for their approval and endorsement.

The Accident Data Task Group of the GADIT met for the first time in June, 2001. This final report was briefed to the GA-JSC on August 12, 2002.

BACKGROUND

The National Transportation Safety Board (NTSB) is charged by Congress to investigate all civil and public-use aircraft accidents. Within five days of when an aviation accident occurs, the NTSB Investigator in Charge (IIC) submits a Preliminary Accident Report with early factual information about the accident. The Preliminary Report contains information on the time and location of the accident, aircraft make/model involved, crew and operator, flight plan and itinerary of the flight, weather, damage and injuries as well a brief narrative statement of facts, conditions, and circumstances pertinent to the accident.

After the IIC completes the full investigation, which usually takes from six to nine months, the IIC submits a Factual Report containing more detailed information on many of the areas contained on the preliminary report, as well as more detailed description of the accident. When the determination of the probable cause(s) is approved by the NTSB, the Final Accident Report is published. In August, 2002, the time from the date of an accident to the time the NTSB publishes the Final Reports of a general aviation accident is between nine and twelve months.

The information from all these reports is entered into the NTSB's Accident Data Management System (ADMS), which is the official repository of all aviation accident data and causal factors.

The operator of an aircraft involved in an aircraft accident is required to file a report on NTSB Form 6120.1/2. The information on this form is used by the IIC to complete the Factual and Final accident reports. A sample copy of NTSB Form 6120.1/2 in included in this report as Appendix F.

The NTSB also investigates certain aircraft and airspace incidents, which is also included in the ADMS. The majority of the data in the NTSB accident database is accessible through their web site, www.ntsb.gov.

Most other aircraft accident databases are made up of data that is either extracted or interpreted from the data in the NTSB Accident/Incident Database. The FAA takes data from NTSB Preliminary and Factual Reports and puts it into its Accident/Incident Data System (AIDS), which is maintained by the FAA's Flight Standards Service (AFS) in Oklahoma City. The FAA also takes this NTSB accident data and makes it available via the internet through their National Safety Data & Analysis Center (NASDAC), where it is merged data from AIDS.

The AOPA Air Safety Foundation (ASF) accident database includes accident data for fixed wing general aviation aircraft under 12,500 pounds. This database is used as the basis for the yearly Nall Report, which is ASF's annual general aviation safety report. Robert Breiling Associates maintains an accident database of all US business jet and turbo prop accidents since 1962. Bell Helicopter Textron also maintains a database of helicopter accidents. All of these accident databases originate from data supplied by the NTSB.

METHODOLOGY

When developing the methodology used to analyze general aviation accident-data needs, the GADIT used the following guidelines:

- Evaluating data needs would necessarily begin with a subjective analysis by a wide array of topical experts. (This is similar to the "root cause" analysis that is an integral part of each Joint Safety Analysis Team (JSAT)). GADIT members therefore included recognized accident-data experts from both industry and government. (A list of participants is included in Appendix C.)
- When analyzing safety needs, to the extent applicable and feasible the GADIT would employ the objective techniques and processes prescribed for the JSAT/JSIT process developed for "Safer Skies".

Prior to conducting its analysis, the GADIT reviewed the current availability, sources and uses of a wide variety of general aviation accident data, including data produced by the National Transportation Safety Board, the FAA, various trade and membership associations and commercial vendors.

The GADIT – Accident-Data methodology consisted of 10 steps (see Figure 1).

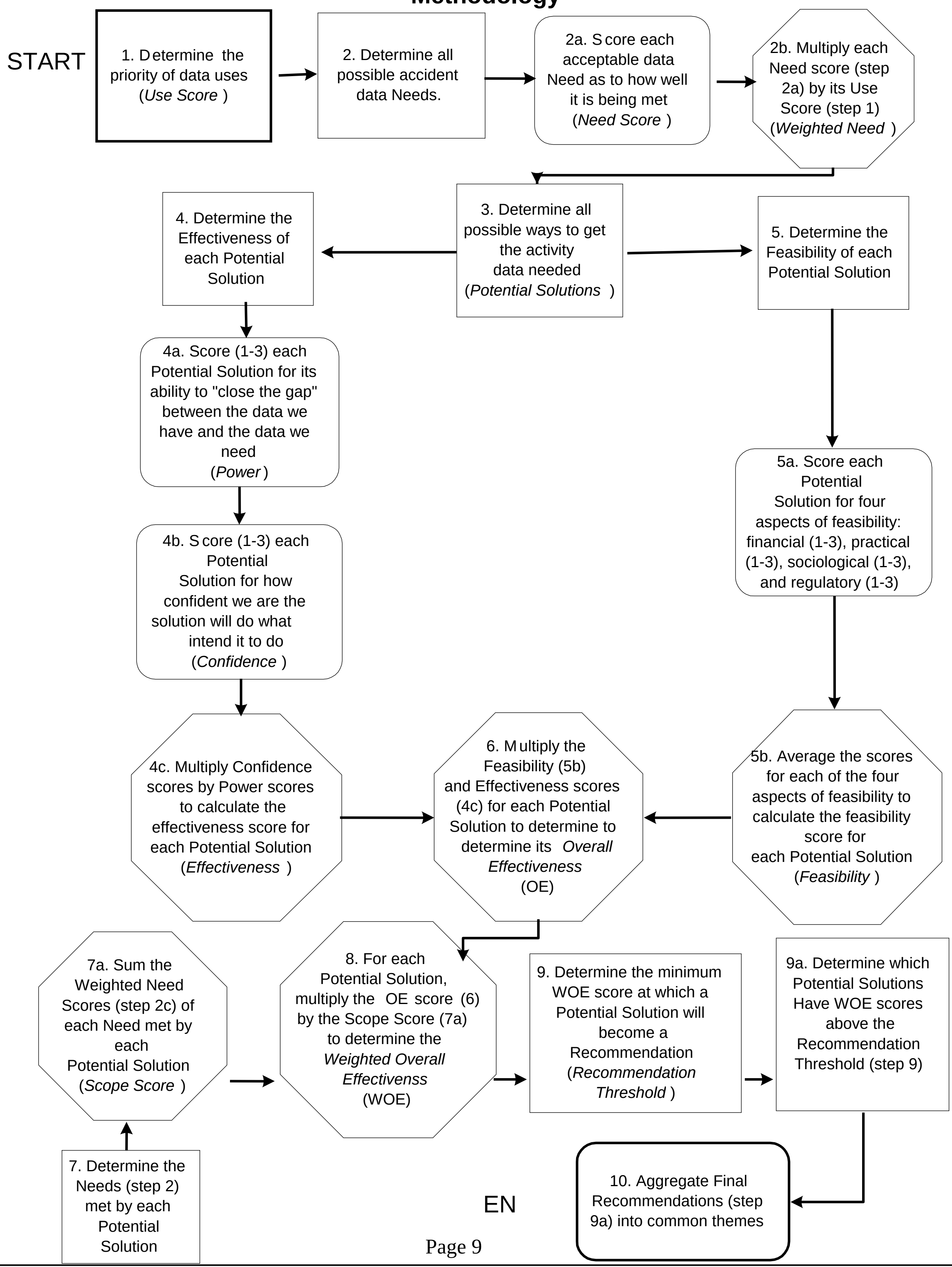
1. Weight the Different Uses of Accident Data. The GADIT began its analysis by identifying the possible uses of general aviation accident data. The GA-JSC had previously identified the following areas as targets for "Safer Skies": Controlled Flight Into Terrain, Weather, Aeronautical Decision Making, Runway Incursions and Survivability. The GADIT added the general term "Analysis" as another possible use for accident data. An accident data-need identified by the GADIT that is directly associated with any of these areas would be assigned a higher weight than other needs. If a data-need was associated with several of these areas simultaneously, it was weighted higher than a data-need associated with only one of these areas.

2. Identify Accident Data Needs. Next, the GADIT determined what accident data was desired, termed a "Need". The baseline was assumed to be whatever accident data is currently available. Therefore, the Needs identified by the GADIT are additional data needed, not total data needs.

For each accident data need, the GADIT developed a detailed description and explanation. Accident data that differed in desired detail, source or frequency was evaluated as a separate data needs, as each might be scored differently for effectiveness and feasibility.

After the accident data Needs were identified and detailed, the GADIT estimated the degree the Need was currently not met. This was termed the "Need Score". Each Need Score was then weighted according to how the data would be used, as determined in step 1. The result was termed the "Weighted Need Score".

Figure 1
Methodology



3. Identify Possible Solutions to Data Needs. The GADIT then identified all solutions that could help close the “gap” between a Need and the accident data currently available. No solutions were excluded during this analysis. The result was a list of all “Possible Solutions”.

4. Determine the Effectiveness of Each Possible Solution. Next, the degree to which each Possible Solution could fulfill a Need was independently scored along two dimensions; how powerful the solution would be when fully implemented (how much it would “close the gap”), scored from 1 to 3, and how confident the Team was that the solution would have the desired affect, scored from 1 to 3. These two scores were then multiplied together to produce a rating of “Effectiveness” for each Possible Solution. At this stage in the GADIT analysis, no consideration was given to the feasibility of any of the Possible Solutions

5. Determine the Feasibility of Each Possible Solution. The feasibility of each Possible Solution was then scored (high=3, medium=2 and low=1) in four dimensions. The solution was assigned a high “financial” feasibility score if the total cost to implement was less than $280,000. The Possible Solution was assigned a high “practical” feasibility score if it did not require extensive changes to an existing practice, procedure or method of collection. The Possible Solution was assigned a high “sociological” feasibility score if implementation would not be heavily opposed by any of the impacted parties. The Possible Solution was assigned a high “regulatory” feasibility score if it did not require a regulatory mandate. For each Possible Solution, these four measures of feasibility were averaged together to calculate its final “Feasibility” score.

6. Determine the Overall Effectiveness of Each Possible Solution. The Overall Effectiveness (OE) of each Possible Solution was calculated by multiplying its Effectiveness score (step 4) by its Feasibility Score (step 5).

7. Determine the Needs Met by Each Possible Solution. After the list of Potential Solutions was finalized, the GADIT created a list of all the Needs addressed by each Potential Solution. By totaling the Needs Score of all Needs addressed by a single Potential Solution, the GADIT measured the depth and breadth of multiple Needs addressed by a single solution. This was termed the “Scope Score”.

8. Weight Each Possible Solution. The GADIT determined that a single Possible Solution could address many Needs, and each of these Needs had a different Need Score. It was therefore essential to weight each Possible Solution according to the degree and number of Needs it addressed. To accomplish this, the GADIT summed the Weighted Need Score (step 2c) for each Need addressed by the Possible Solution, and multiplied this sum by the OE (step 6) for each Possible Solution[1]. This was termed the “Weighted Overall Effectiveness”, or WOE.

9. Establish the Criteria for Final Recommendations. After reviewing the WOE scores for all the Possible Solutions, the GADIT determined that it would consider recommending any Possible Solution with a WOE greater than 6.0 (Recommendation Threshold). Using this criterion, the GADIT compiled the initial list of Final Recommendations.

[1] To simplify presentation, the result of this calculation was divided by 1,000 and rounded to 2 decimals.

10. Aggregate the Final Recommendations. Finally, the GADIT noted that for ease of understanding, the full list of Final Recommendations could be summarized into twelve general areas. (Details of individual Final Recommendations were not lost or combined in this aggregation.)

RESULTS AND CONCLUSIONS

Additional Accident-Data Needs Identified. In addition to the accident data currently available, the team identified 40 other data needs that are detailed, scored and rank-ordered in Table 1 below.

Table 1
Additional Accident Data Needs

Tracking Number	Need Description	Explanation	Need Score Max=3
38	Ability to identify accidents having common elements of findings, factors and causes.	There are 1169 sequence of events codes (covering subjects of aircraft, operations, environment, direct modifiers, and indirect modifiers). These can be combined in an almost unlimited number of ways to describe occurrences that lead to an accident and to document the causes, factors, and findings associated with the investigation. This large number of coding choices is difficult for investigators to fully employ and, as such, difficult to analyze without aggregating sequence codes into larger groups. This methodology should make it easier to find accidents with common elements.	2.41
1	Pilot training? When? In what? From whom? Had pilot attended any Wings or other voluntary FAA safety programs? Had pilot received any non-required recurrent training? Has the pilot received mission specific training? Has the pilot received training relevant to the circumstances of this accident?	Better understanding of recent experience/training. Allows some measure of effectiveness of programs. Allows insight into mindset of pilot. Training has long been an issue and there is insufficient data to develop any recommendations. The data is needed to develop strategies. Training organization and when. Aid in assessing benefits of professional/ simulator training.	2.35
2	New ICAO accident category code.	Standardization for grouping events in categories.	2.29
3	Pilot's experience in specific flight conditions.	This is vital information and will provide insight into training standards and qualifications/experience, and pilot mission pressures and decision-making.	2.24
4	Pilot's regulatory currency and recency of experience.	Provides an indication of the pilot's currency and proficiency at the time of the accident.	2.21
40	What were the crew's actions, communications, and situational awareness immediately prior to the accident (CVR, video)	Analyze human performance.	2.19

Tracking Number	Need Description	Explanation	Need Score Max=3
5	The unsafe acts of operators.	Better define accident data involving human error (for HFACS analysis)	2.18
6	Preconditions for unsafe acts.	Better define accident data involving human error (for HFACS analysis)	2.14
8	Unsafe supervision.	Better define accident data involving human error (for HFACS analysis)	2.07
7	Weather forecast and detailed weather observation at time of event.	Accident data usually only shows if the weather was forecast or not. It would be nice to know whether specific weather phenomenon was forecast or not.	2.07
9	Time of most recent weather briefing.	To help understand how/why pilot encountered weather they were not prepared for.	2.06
10	Pilot accident/incident/violation history.	Identification of risk factors and pilot attitude and proficiency.	2.06
36	Light Conditions (day/night etc)	Will speed analysis if this is spelled out, rather having to compare to official sunset/sunrise	2.04
11	Organizational Influences.	Better define accident data involving human error (for HFACS analysis)	2.03
12	Fully and accurately identify type of: certificates held; certificate operating under at time of accident; operation/purpose of flight; regulation operating under at time of accident; fractional ownership	Provide information on certificates held and nature of operation at time of event.	2.00
37	Whether the flight was on (activated) a VFR or an IFR Flight Plan	Will speed analysis of accidents.	1.98
13	Any evidence pilot was aware of terrain features (charts in aircraft, had flown route before, ATC warnings, etc.)?	Insight for evaluation of CFIT.	1.97
14	Precise location of event site (lat/long).	Ability to map location relative to airport or other location.	1.96
15	Pilot's primary base of operation (airport/FSDO)?	Did an accident occur in unfamiliar territory or at or near home base.	1.96
16	Actual flight time and landings the pilot made that day? Intended flight time and landings that day?	This is important because there are pilot human factors issues associated with attitude if it is the first flight/leg of the day, or the last.	1.90
17	Better access to all imaged docket material in the accident database.	Easier, faster analysis of accident and investigation; allows easy determination of whether pertinent additional detail is available.	1.87

Tracking Number	Need Description	Explanation	Need Score Max=3
18	Struck obstruction detail: No visual obscuration; Day, Wx Obscuration; Day, Wx Obscuration; Night.	This provides a quick summary of the nature of a CFIT or weather accident presently unavailable without searching several fields.	1.86
39	Record aircraft performance information	Analyzing aircraft performance during accident flight.	1.85
19	Non-pilot airman certificates/ratings held by pilot. Other aviation qualifications of pilot.	Allows evaluation of pilot capabilities.	1.79
20	Identify type of on-demand air taxi operating certificate; full operating certificate, basic operating certificate, single-pilot operator. Differentiate between type of certificate held and the one operating under.	Current information available shows whether the operator is an on-demand air taxi or a commuter operator. However, within the on-demand air taxi certificate are 3 more levels. Need data to determine which type of operator may be having events.	1.75
21	Crash kinematic information: Flight path angle, impact angle, bank angle of impact, depth of ground scar, length of ground scar, crush line angle on fuselage both vertical and longitudinal, cabin/cockpit deformation, restraint system failures and use by occupants, type of terrain.	Allows crashworthiness/survivability analysis.	1.74
22	Nature and source of injuries and age of all occupants and location in aircraft.	Allows crashworthiness/survivability analysis.	1.74
35	Did the pilot rent the aircraft; did the pilot get the aircraft from a flying club; was the pilot the aircraft owner; did the pilot share aircraft ownership with others?	Better definition of the pilot's relation to the accident aircraft may provide clues to the pilot's actual proficiency.	1.65
23	Use standard aircraft/engine make/model/series codes.	Use a standard code for the accident/incident aircraft and/or engine.	1.63
24	Was the aircraft modified from its original type design by STC/Form 337/log entry/other? What were the modifications?	Allows analysis of effects of modifications; particularly valuable in view of current questions about aging aircraft.	1.60
25	Pilot's formal education level?	Useful for identifying risk factors and targeting preventative measures.	1.58
26	Link accidents in NTSB's accident database to NTSB's safety recommendations.	Easier, faster analysis of safety interventions.	1.57
27	Airframe year of manufacture	Indicates the age of the aircraft.	1.57

Tracking Number	Need Description	Explanation	Need Score Max=3
28	Has the pilot received hypobaric chamber training?	Identify if pilot involved in a high altitude related accident had related training.	1.56
29	Use ATA Codes for aircraft systems and components.	The Air Transport Association Specification 100 codes of aircraft system/components. Interested in the 4-character code [e.g., 3510 for crew oxygen system]. Many databases use this code [SDR, for example] and it would make it easy to research any related events to the accident/incident.	1.50
30	Airport certificate? CFR/ARFF facility on field? What category/type CFR/ARFF? Was it used/activated? Time of call? Time of response? Impediments to response? Mutual aid agreement/response?	Allows understanding of CFR/ARFF effectiveness.	1.49
31	Standard operator codes.	The FAA-assigned designator (if applicable) of the business entity involved.	1.40
32	Was the operator/owner insured for liability?	Presents another piece of data with which to evaluate pilot mindset/habits.	1.40
33	Was the aircraft hull insured?	Presents another piece of data with which to evaluate pilot mindset/habits.	1.39
34	FAA Region and FSDO where event occurred.	Analytical data for regions and FSDOs.	1.36

Possible Solutions Identified. The accident-data team identified 72 possible solutions, which are detailed and scored in Table 2 below. These same solutions are depicted graphically, ranked-ordered by their Weighted Overall Effectiveness in Figure 2.

Table 2
Solutions for Accident Data Needs

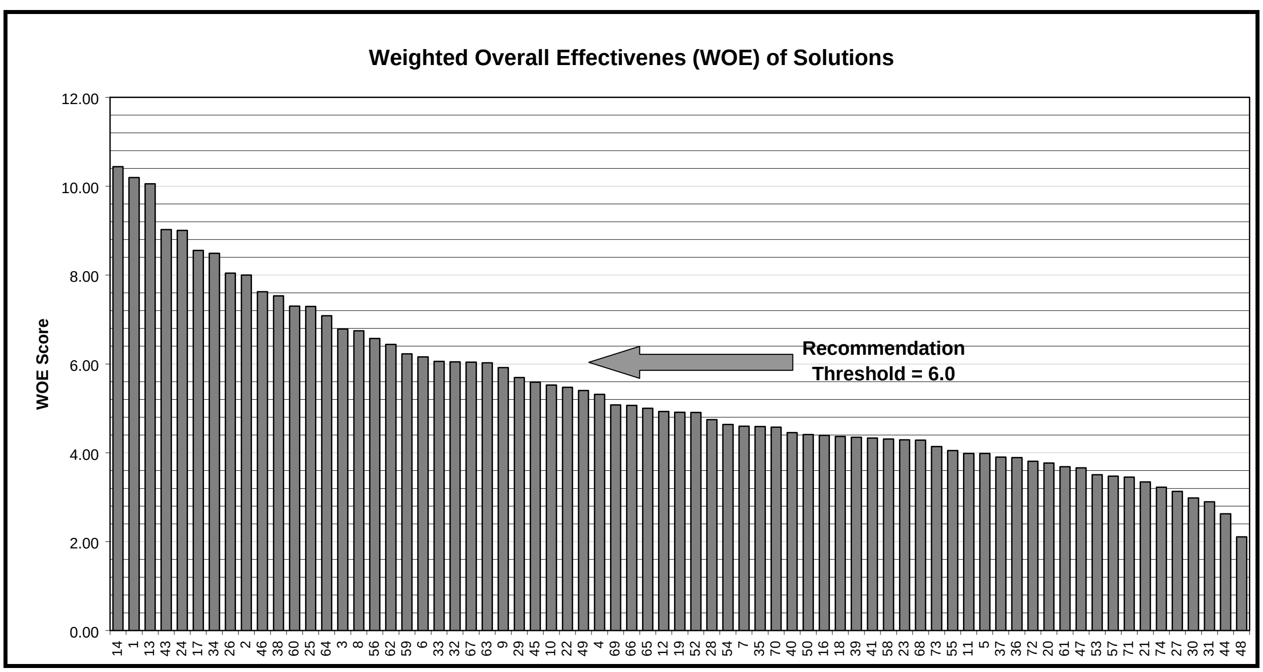
Sol #	Solution Description	Effect.	Feas.	Overall Effect.	Weighted Need Score	Weighted Overall Effect
1	Implement accident category (ICAO) designations	6.07	11.64	70.62	14.44	10.20
2	Design analytical tool for existing sequence of event coding (for analysts)	5.35	10.36	55.41	14.44	8.00
3	Apply CAST/ICAO Make/model/series structure to accident data structure for new accidents	6.59	10.57	69.62	9.75	6.79
4	Implement a more comprehensive interface for web-based query and browsing (e.g. human error, survivability, environmental data, etc)	3.85	9.57	36.81	14.44	5.32
5	Request / obtain and document better pilot information/data (source of pilot training, formal education, non-regulatory training, etc) from additional sources (eg. Personal sources, pilot records, FBOs)	3.81	7.43	28.31	14.08	3.99
6	Link pilot information from Airman Registry and Comprehensive Airman Information System CAIS (med) to NTSB Accident Data Management System (ADMS)	4.62	10.07	46.48	13.25	6.16
7	Link landing facility (Nat'l Flight Data Center) data via airport ID to ADMS	4.43	11.64	51.58	8.92	4.60
8	Link aircraft information to ADMS from Aircraft Registry	6.64	10.79	71.61	9.42	6.75
9	Link operator info to ADMS from FAA's National Vitals Info System (NVIS)	4.46	10.14	45.25	13.08	5.92
10	Link Nat'l Climatic Data Center; Weather observations and terminal forecast received by pilot to ADMS	5.15	8.64	44.49	12.42	5.53
11	Educate pilots and maintenance techs about importance of keeping training records current	3.78	7.50	28.31	14.08	3.99
12	Link pilot safety program participation (wings) from FAA Prog Tracking & Recording System to ADMS	4.15	8.43	35.01	14.08	4.93
13	Establish which data on the investigator's accident report (ADMS) is mandatory and ensure reporting compliance	7.24	9.86	71.39	14.08	10.05
14	Revise NTSB pilot / operator reporting form 6120.1/2 to track with ADMS and the data needs identified in other data solutions	6.65	11.14	74.15	14.08	10.44
16	Provide NTSB field investigators with access to EIS (enforcement information system)	3.55	8.79	31.19	14.08	4.39
17	Apply FAA standard used in National Vitals Info System (AFS-620) for operator designators in ADMS	5.49	10.79	59.23	14.44	8.55
18	Notwithstanding a written statement, interview the surviving pilot or next of kin, crew, passengers to capture accident data (and operational and human factors info to relevant accident)	4.29	7.23	31.02	14.08	4.37

19	Link pilot education/profession information from CAIS to ADMS.	4.47	10.21	45.69	10.75	4.91
20	Require airmen to periodically complete a comprehensive questionnaire identifying qualifications, background, ed, ft time history, etc	4.46	6.00	26.77	14.08	3.77
21	Convene special teams (outside NTSB) to investigate certain types of accidents such as CFIT, WX, RI, etc.	3.81	6.08	23.16	14.44	3.34
22	Implement human-factors coding (eg HFACS) into NTSB database (ADMS)	4.57	8.50	38.88	14.08	5.48
23	Require more detailed description of accident site (eg type of scar and dimensions, terrain, location of remains and aircraft parts)	3.69	9.36	34.55	12.42	4.29
24	Provide investigators (govt, industry) with GPS handhelds and require accident lat/long coordinate reporting	6.55	11.07	72.51	12.42	9.01
25	Require investigators to perform thorough background investigation of airman (pilot/mx tech) involved in accident, not limited to 24/48/72 hr activities (#5, 11, 18, 20)	7.11	7.64	54.35	13.42	7.29
26	Implement a Human Factors checklist / protocol to be used by field investigators to collect and enter human-factors data (eg HFACs).	6.02	9.50	57.19	14.06	8.04
27	Link NTSB open recommendations to accidents (using accident number) cited in the NTSB recommendation letter	3.69	9.00	33.23	9.42	3.13
28	Require investigators to review pilot log book if available.	4.00	8.43	33.71	14.08	4.75
29	Upgrade NTSB computers and software to support data capture (i.e. docket) and processing.	4.08	10.14	41.41	13.75	5.69
30	Provide NTSB investigators access to the Safety Performance Analysis System.	3.38	8.40	28.42	10.50	2.98
31	Query Insurance Companies for pilot information	3.36	7.00	23.49	12.33	2.90
32	Expand the information included in preliminary reports, including accident type (e.g. ICAO CAST category) if known	4.46	9.86	43.98	13.75	6.05
33	Increase the number of NTSB field investigators	5.15	8.36	43.02	14.08	6.06
34	Improve the qualifications / training/ recurrent training of accident investigators (FAA & NTSB) (e.g. human factors, technology)	7.35	8.00	58.80	14.44	8.49
35	Standardize the information required to be recorded in a pilots logbook	4.54	7.00	31.81	14.44	4.59
36	Standardize the information required to be recorded in an aircraft's maintenance logbook.	5.08	7.36	37.35	10.42	3.89
37	Better define aircraft damage classification to qualify as an accident	3.18	8.50	27.04	14.44	3.90
38	Create a tool for field investigators that makes coding the sequence of events more consistent	6.05	8.62	52.15	14.44	7.53
39	Require NTSB to code ATA code into accident data	4.31	11.21	48.31	9.00	4.35
40	Insert intersecting runway information in the Landing Facilities data base (NFDC)	3.41	9.50	32.38	13.75	4.45
41	Authorize and require FAA to determine airworthiness status of accident aircraft and, in the case of a destroyed aircraft, take possession of the data plate.	4.27	7.21	30.77	14.08	4.33

43	Offer entire accident docket electronically to the public (back to 1996)	5.68	11.00	62.49	14.44	9.02
44	Make FAA aircraft data file available electronically to the public (337, STCs)	3.67	6.86	25.20	10.42	2.63
45	Develop an algorithm for use by investigators that converts date, location, and time of day to light conditions	3.99	10.43	41.65	13.42	5.59
46	In collaboration with industry, identify criteria for selecting the accidents where NTSB field investigators should be onsite	5.30	10.21	54.15	14.08	7.62
47	Modify ADMS to capture the contents of the cockpit (maps, electronic charts, etc) and where each article was located	3.61	8.57	30.96	11.83	3.66
48	Perform an autopsy of all occupants of GA aircraft to include survivability info	3.30	6.13	20.22	10.42	2.11
49	Use only designated FAA FSDO inspectors who have received training in addition to initial TSI accident course (not every GA FSDO inspector)	5.11	7.50	38.34	14.08	5.40
50	Use only FAA FSDO inspectors to perform accident investigations that have participated in NTSB accident investigator training	4.29	7.31	31.35	14.08	4.41
52	Require that investigators solicit training history from appropriate training sources	4.28	8.14	34.85	14.08	4.91
53	Modify NTSB ADMS to collect crash kinematic information	3.99	8.43	33.66	10.42	3.51
54	Modify NTSB ADMS to collect specific injury data for all occupants	5.66	7.86	44.49	10.42	4.64
55	Develop and disseminate standardized protocol for coroners / medical examiners to use during autopsies and toxicological tests	3.83	10.14	38.89	10.42	4.05
56	Implement programs (such as quality control, edit checks, dropdowns) so that the ADMS is more accurate, complete, and standardized	6.25	8.77	54.76	12.00	6.57
57	Modify (and link) NTSB ADMS to collect specific aircraft modification data (STCs, field approvals, and unapproved modifications - these are currently paper/microfiche records).	4.62	7.71	35.60	9.75	3.47
58	Require that modification info specific to an aircraft be filed with the FAA in the aircraft's registration file and be available in electronic format (337's)	5.68	7.79	44.23	9.75	4.31
59	Develop low cost flight data info recorders	5.90	8.07	47.62	13.08	6.23
60	Code previous NTSB accidents with ICAO categories back to 1983	5.90	9.00	53.10	13.75	7.30
61	Acquire accident pilot enforcement / violation history information, deidentify it, aggregate them, and make totals publicly available	3.48	8.00	27.83	13.25	3.69
62	Enforce the requirement to complete 6120.1 following an accident	5.32	8.60	45.76	14.08	6.44
63	Make the 6120.1 available for electronic or web-enabled submission	4.80	11.14	53.54	11.25	6.02
64	Modify 6120.1 and ADMS to identify type of flight (activity and purpose of flight) to correlate with GA survey flight activity categories	5.03	11.57	58.21	12.17	7.08

65	Record verbatim the weather forecast and observations provided to the pilot	4.49	8.52	38.25	13.08	5.00
66	Modify 6120.1 to get pilots perception (observation) of weather at time of accident	3.59	10.79	38.72	13.08	5.06
67	Apply ICAO make/model/series structure to accident data structure for accidents back to 1983	6.43	9.64	61.96	9.75	6.04
68	Designate a single government Agency/Office for dissemination of General Aviation accident data	3.12	9.50	29.68	14.44	4.29
69	Require aircraft mounted GPS units to record position, altitude and time	5.49	7.07	38.83	13.08	5.08
70	Develop low cost crew action recorders (CVR, video)	4.92	7.07	34.81	13.15	4.58
71	Require installation of low cost crew action recorders (CVR, video) in all aircraft	5.49	4.79	26.28	13.15	3.46
72	Require installation of low cost crew action recorders (CVR, video) for new aircraft	5.14	5.64	28.98	13.15	3.81
73	Require installation of low cost flight data recorders (FDR) for new aircraft	5.40	5.86	31.65	13.08	4.14
74	Require installation of flight data recorders on all aircraft (new and retrofit)	4.79	5.14	24.65	13.08	3.22

Figure 2



GADIT ACCIDENT DATA RECOMMENDATIONS

Approach to Organizing the Solutions for Implementation

The GADIT Accident Data Group identified three-dozen solutions that, if implemented, could improve our ability to understand the many different aspects of general aviation safety. Recognizing that it would not be feasible to implement all the solutions discussed during the course of the group's deliberations, the group used the methodology described in the previous section to prioritize the solutions. This process identified solutions that the GADIT recommends for implementation.

Data activities associated with accident information could have been grouped based on information content (injury, human performance, vehicle, environment, etc) and the GADIT considered organizing the solutions according to how they would improve our knowledge about those subjects. However, after debating on several approaches, the GADIT recognized the value of grouping the solutions based on their functional implications rather than subject content. The task group felt that this approach facilitated the next stage of the Safer Skies' implementation work because solutions within a group would be aligned with the responsible organizations that would work to towards implementation. Solutions were organized into the following groups; solutions within each group are identified by number as detailed in the following table:

- Standardize Accident Information
  (solution numbers 1, 3, 17, 22, 32, 39, 55, 56, 60, 67)

- Improve Quality and Completeness of Accident Records
  (solution numbers 13, 14, 24, 25, 26, 38, 45, 62, 63, 64, 66)

- Link the Accident Database to Other Aviation Safety Databases
  (solution numbers 6, 7, 8, 9, 10, 19)

- Improve Accident Data Accessibility for Research and Analysis
  (solution numbers 2, 4, 29, 43)

- Improve Accident Investigator Training
  (solution numbers 34, 49)

- Formalize Criteria for Initiating NTSB Field Investigations
  (solution 46)

- Increase Resources for General Aviation Accident Investigations
  (solution 33)

- Develop Low Cost Airborne Data Recorders
  (solution 59)

Each numbered solution is identified in the following table. A discussion of solutions, organized by group, is included in the section following the table.

STANDARDIZE ACCIDENT INFORMATION	
1	Identify a common taxonomy of accident types using CAST/ICAO aviation accident category designations in the accident database
3	Apply CAST/ICAO standards for aircraft make/model/series groupings to the accident data structure for new accidents
17	Apply FAA standards for operator designators used in National Vitals Info System (AFS-620) to the aviation accident database (ADMS)
22	Implement human-factors coding (e.g. HFACS) into the NTSB aviation accident database
32	Expand the information included in preliminary reports, including accident type (e.g. ICAO/CAST category) if known
39	Code accident aircraft information about systems/subsystems/components according to Air Transport Association code
55	Develop and disseminate standardized protocol for coroners / medical examiners to use during autopsies and toxicological tests
56	Implement programs (such as quality control, edit checks, dropdowns) so that the NTSB accident database is more accurate, complete, and standardized
60	Code previous NTSB accidents with CAST/ICAO categories back to 1983
67	Apply CAST/ICAO make/model/series structure to accident data structure for accidents back to 1983
IMPROVE QUALITY AND COMPLETENESS OF ACCIDENT RECORDS	
13	Establish which data on the investigator's accident report (ADMS) is mandatory and ensure reporting compliance
14	Revise NTSB pilot/operator reporting form 6120.1 to track with Accident Data Management System (ADMS) and the data needs identified in other data solutions
24	Provide investigators (government and industry) with handheld global positioning system (GPS) recorders and require accident latitude/longitude coordinate reporting
25	Require investigators to perform thorough background investigations of airman (pilot/maintenance tech) involved in accident, not limited to 24/48/72 hr activities
26	Implement a Human Factors checklist / protocol to be used by field investigators to collect and enter human-factors data (e.g. HFACs).
38	Create a tool for field investigators that makes coding the sequence of events more consistent
45	Develop an algorithm for use by investigators that converts date/location/time of day to light conditions
62	Enforce the requirement to complete pilot/operator report form 6120.1 following an accident

63	Make the pilot/operator report form 6120.1 available for electronic or web-enabled submission
64	Modify pilot/operator report form 6120.1 and Accident Data Management System (ADMS) to identify type of flight (activity and purpose of flight) to correlate with GA survey flight activity categories
66	Modify pilot/operator report form 6120.1 to get pilots perception (observation) of weather at time of accident
	LINK AVIATION ACCIDENT DATABASE TO OTHER AVIATION SAFETY DATABASES
6	Link pilot information from FAA's Airman Registry and Comprehensive Airman Information System CAIS (medical information) to NTSB Accident Data Management System (ADMS)
7	Link landing facility (Nat'l Flight Data Center) data via airport ID to Accident Data Management System (ADMS)
8	Link aircraft information to ADMS from Aircraft Registry
9	Link operator info to Accident Data Management System (ADMS) from FAA's National Vital Info System (NVIS)
10	Link Nat'l Climatic Data Center weather observations and terminal forecast received by pilot to Accident Data Management System (ADMS)
19	Link pilot education/profession information from Comprehensive Airman Information System (CAIS) to Accident Data Management System (ADMS).
	IMPROVE ACCIDENT DATA ACCESSIBILITY FOR RESEARCH AND ANALYSIS
2	Design an analytical tool for existing sequence of event coding to assist analyst in working through the many levels of event coding and categorization of probable causes
4	Implement a more comprehensive interface for web-based query and browsing (e.g. human error, survivability, environmental data, etc)
29	Upgrade NTSB computers and software to support data capture (i.e. docket) and processing.
43	Offer entire accident docket electronically to the public (back to 1996)
	IMPROVE ACCIDENT INVESTIGATOR TRAINING
34	Improve the qualifications / training/ recurrent training of accident investigators for both FAA & NTSB (e.g. human factors, technology)
49	Use only designated FAA FSDO inspectors who have received training in addition to initial TSI accident course (not every GA FSDO inspector)
	Formalize the criteria for initiating NTSB field investigations
46	In collaboration with industry, identify criteria for selecting the accidents where NTSB field investigators should be onsite

INCREASE RESOURCES FOR GA ACCIDENT INVESTIGATIONS	
33	Increase the number of NTSB regional aviation safety investigators.
DEVELOP LOW COST AIRBORNE DATA RECORDERS	
59	Develop low cost flight data info recorders

Solution Areas

Standardize Accident Information. Several of GADIT's solution-groups address data quality, but each from a different points of view. The first solution area focused directly on standardizing accident information as a way to improve accident data quality. These improvements would enhance the ability of analyst and data users to identify relationships among accidents, which, in turn, would improve how the accident data can inform us about certain categories of risk. For example, a solution that generally summarizes the intent of most of these solutions to standardize information (solution 56) called for the NTSB to implement computerized methods (such as dropdown pick lists, required data fields, edit and logic checks) to improve the accuracy, completeness and standardization of aviation accident data.
There were ten solutions that broadly addressed standardizing accident information. Most of those solutions related to the use of taxonomies or structured information formats to characterize accident information.

GADIT recognized the value of recent work by the Commercial Aviation Safety Team/International Civil Aviation Organization (CAST/ICAO) Common Taxonomy Team. That group has developed a list of accident categories and definitions (for CFIT, Runway Incursion, etc) that would be very useful for identifying types of accidents. GADIT suggested that the use of these categories be implemented by NTSB for future accident coding (solution 1) and that it would also be useful to code accident history back to 1983 (solution 60).

Where possible, the GADIT also suggested that accident category coding be included in the preliminary reports of accidents (solution 32). The GADIT noted that human error is a leading cause of aviation accidents but that documenting and understanding human error is difficult. The Human Factors and Analysis Classification System (HFACS) has been successful in broadly categorizing NTSB accident history; therefore the GADIT suggested that this coding be associated with the NTSB database (solution 22). A likely portal for this information would be the FAA NASDAC web site.

CAST/ICAO has also been developing a data structure for standard identification of aircraft make/model/series. GADIT encouraged the NTSB to apply this data structure in all future accident coding (solution 3) and that the standard for coding of aircraft make/model/series be applied to accidents since 1983[2] (solution 67). Similarly, the Air Transport Association (ATA) has developed a coding structure for identifying aircraft systems/subsystems/components that is widely used by commercial maintenance organizations. Though not strictly a taxonomy, the GADIT recommended that aircraft structures associated with an accidents be identified by ATA codes (solution 39). It was assumed that for smaller, general aviation aircraft, only the high level, general system codes would be applicable. GADIT solution 17 also called for the use of FAA standard operator designations in aviation accident records.

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[2] In 1983 the NTSB adopted a change to the aviation accident data structure. Much of the prior year's accident data is in an incompatible software format compared to 1983 to present. Substantial changes to the aviation industry over the past 20 years, both in terms of operations and aircraft design, have dictated a useful analytical timeframe of 1983 to present, and the GADIT adopted this convention.

Local coroners and medical examiners provide autopsies and toxicological testing to support aviation accident investigations. The GADIT recognized that these come from many different sources and areas of expertise and recommended that those sources be provided with a standardized protocol to facilitate the collection of standardized information (solution 55).

Improve Quality and Completeness of Accident Records. Like the first group of solutions that focused on improving data quality through standardization, a second group of 11 solutions focused of improving data quality through the use of better accident investigation methods and tools. One of the broader solutions called for establishing mandatory data fields for use by accident investigators to complete an accident record (solution 13). But this group also included some very specific solutions, for example, GADIT identified a specific need for all accident investigators to have handheld global positioning systems (GPSs) to record the latitude and longitude coordinates of an accident's location (solution 24). Another specific solution called for the development of a tool for investigators that would convert date, location, and time of day into event light conditions (solution 45).

The GADIT's focus on better data to describe human error was again evident in solution 25, which called for investigators to perform more thorough background investigations. This solution, in a general way, addressed several other solutions that did not rank among those with implementation priority (such as better documentation of pilot training/education, educate pilots about record keeping, interview all surviving pilots, periodically collect pilot information on qualifications, background, flight time). A related solution was to implement a human factors checklist, such as HFACS, that could be used by field investigators to collect and enter human factors data (solution 26).

For many analytical purposes, the investigator's coding of the accident's sequence of events offers the only way for identifying some accident types. An accident's sequence of events is a matrix of occurrences during a phase(s) of operation, each coded for subject, modifiers and/or persons involved. Subjects are further identified based on their association to the accidents as a cause, factor, or finding. This sequence of events coding reflects the investigator's statement of the accident's probable cause. The complicated nature of this information makes it difficult to analyze, particularly for those that are not familiar with the data. The task group recognized that the complexity of sequence of event coding can be a problem for accident investigators and recommended the development of a tool to assist investigators in consistently coding sequence of events (solution 38).

Nearly half of the solutions designed to improve the completeness of accident data (5 of 11 solutions) focused on improvements in the data collected from pilots and operators (via NTSB Form 6120.1 Pilot/Operator Aircraft Accident/Incident Report). Several solutions were quite specific; e.g., record pilot's perception of weather at time of accident (solution 66); revise type of flight categories to be consistent with categories of flight activity (solution 64). But several solutions more generally addressed pilot data; e.g. web-enable electronic submission of Form 6120.1 (solution 63); enforce the requirement for pilots to complete the form following an accident (solution 62); and revise the form to track against the database and incorporate the data needs identified in other GADIT solutions (solution 14)

Link the Accident Database to Other Aviation Safety Databases. GADIT recognized that it is both desirable and feasible to link relevant aviation databases to enrich what we know about accidents. On a case-by-case basis accident investigators currently reference several web-based sources to complete accident records and this is one form of linking data. But the GADIT solutions in this group seek more technologically advanced methods of connecting related data. The group did not constrain their solutions by specifying how data should be linked (e.g., data warehousing or autofill data entry programs), assuming that there were many aspects to these solutions that would need to be considered. The following databases were recognized as having valuable information that could be used to enrich accident data records:

- FAA Airman's Registry and the Comprehensive Airman Information System, (CAIS) (solution 6 and solution 19)
- National Flight Data Center (solution 7)
- FAA Aircraft Registry (solution 8)
- FAA National Vital Information System (NVIS) (solution 9)
- National Climatic Data Center (solution 10)

Two issues about linking accident data to other aviation databases played prominently in the GADIT discussions. First there are always personal privacy concerns when data collected in a database for one purpose are linked to data in another database. This is obviously an issue relevant to airman's medical information. Second, incomplete or incorrect data used to automatically fill aviation accident records will not improve the quality of the data; quite the opposite, it creates a perpetuation of errors. The issue of complete and accurate records will need to be considered for all of the proposed linking solutions, particularly the Airman's Registry and the National Vitals Information System. Issues of privacy and accuracy will probably dictate that the NTSB accident database not automatically incorporate information from other government databases, but, rather the information may be linked by creating a data warehouse environment where separately selected databases can be connected for analytical purposes. The GADIT thought that type of data linking, as well as other approaches, should be further explored.

Accident Data Accessibility for Research and Analysis. In January 2000, the NTSB made aviation accident data available on its web site in a relational database structure that allowed access using common database software programs. Current and past year data sets can be downloaded and a query tool for identifying specific accidents is available. GADIT recognized this as a commendable step in the right direction but also identified a few solutions that would improve public accessibility to accident data.
While the current data is available on the NTSB web site, there are only a few user tools to guide researchers in the use of this rather complicated database. GADIT suggested implementing a more comprehensive interface for web-based query and browsing (solution 4). Although the solution did not include specific details, the discussion highlighted a need for a user interface that assisted in formulating queries based on questions of interest and that yielded a data set of customized accident results. A related solution called for the development of an analytical tool to assist researchers in using the sequence of event data (solution 2). As mentioned earlier, the complicated structure of the sequence of event data is not easily understood by the casual user.

In addition to the NTSB accident database, there are many other facts related to accident investigations that are collected and stored in the NTSB public docket. It would be useful to offer the entire docket[3] to be electronically available to the public (solution 43). In considering the suggestion to make the NTSB public docket available over the web, GADIT recognized that information technology upgrades, such as the purchase of new network servers and high-speed access capabilities, would be required. To support this solution and several other computer related solution in other areas, GADIT called for upgrades in NTSB computers and software to support data capture and processing (solution 29).

Improve Accident Investigator Training. GADIT recognized that the skill and ability of the accident investigators and the time allotted to investigators for working each accident are some of the most important aspects of acquiring quality accident data. The NTSB uses the staff resources of the FAA to supplement the 50+ aviation accident investigators that investigate almost all general aviation accidents. One solution identified by GADIT to improve accident data was to improve the qualification and training of accident investigators (solution 34). Along that same line, but particularly with regard to FAA flight standards inspectors whose collateral duty is to assist in accident investigations, GADIT recommended that training include both the initial TSI accident course and recurrent training (solution 49). Recurrent training seemed particularly important for safety inspectors conducting accident data collection on an infrequent basis.

Formalize Criteria For On-Site NTSB Investigations. The NTSB conducts many different types of accident investigations: major, field, limited, delegated, etc. The different types depend on aircraft size and type of operation as well as location (domestic and foreign). With regard to general aviation accidents, the majority are either field investigations or limited investigations. GADIT solution 46 calls for NTSB, in conjunction with industry, to identify criteria for selecting accidents where NTSB field investigators should be on-site.

Increase Resources for General Aviation Accident Investigations. Recognizing that NTSB has adopted different types of accident investigations to, in part, optimize limited accident investigation resources, the GADIT's interest in investigating general aviation more thoroughly led to a recognition that an increased number of NTSB field investigators is needed (solution 33).

Develop Low Cost Airborne Data Recorders. Aviation has a long history of using flight data recorders (FDRS) in commercial aircraft. FDRs have proved invaluable to the work of accident investigations, as evidenced by the continuing trend for expanding the number of data channels. In most transportation modes, the use of data recorders is proliferating (ship voyage recorders, trucks data recorders, railroad event recorders, etc.). The GADIT recognized that there is resistance to requiring small aircraft to be FDR equipped; there are financial as well as political ramifications. But from an accident data improvement point of view, flight data recorders could supply a wealth of

[3]Prior to 1996, the NTSB docket was maintained in a microfiche and has not been converted to an electronic format. Beginning in 1996, the NTSB used an electronic format for the docket and the GADIT solution recommends that this more recent timeframe be made available electronically to the public.

information about accident characteristics. In what was viewed as a first step, the GADIT approach to this issue was to call for the development of low cost flight data recorders (solution 59).

LIST OF APPENDICES

APPENDIX A

GLOSSARY OF ACRONYMS

ADMS - Accident Data Management System
AIDS - Accident/Incident Data System
AFS - Flight Standards Service
AOPA - Aircraft Owners and Pilots Association
ASF - Air Safety Foundation
CFIT - Controlled Flight into Terrain
FAA - U.S. Federal Aviation Administration
GAMA - General Aviation Manufacturer's Association
GA - General Aviation
GADIT - General Aviation Data Improvement Team
HAI - Helicopter Association International
HFACS - Human Factors Analysis and Classification System
ICAO - International Civil Aviation Organization
IIC - Investigator in Charge
JSAT - (Safer Skies) Joint Safety Analysis Team
JSC - (Safer Skies) Joint Steering Committee
JSIT - (Safer Skies) Joint Safety Implementation Team
NASDAC – National Aviation Data & Analysis Center
NBAA - National Business Aircraft Association
NTSB - National Transportation Safety Board
OE - Overall Effectiveness
WOE - Weighted Overall Effectiveness

APPENDIX B
GADIT CHARTER
"Safer Skies"
Terms of Reference
General Aviation Data Improvement Team (GADIT)

April 20,2000

Problems:

1. Studies completed by the CFIT and Weather JSAT's and JSITs identified insufficient quantity and quality of Data about the "root cause" of GA accidents, and an almost total lack of detail about GA incidents, as a hindrance to improving GA safety.
2. The JSC determined that a lack of adequate general aviation exposure data (hours flown) prevents measuring the success of the JSC's "Safer Skies" initiatives by comparing the annual GA accident rate over time. Instead, the JSC was forced to use an annual reduction in the number of fatal accidents as the metric for success. This metric would be distorted if GA activity increases significantly.

The GADIT will:

1. Develop implementation strategies to:
   a. Increase detail about the factors that have contributed to or caused general aviation
   accidents and incidents.
      i. The primary focus should be on accidents or incidents related to weather, CFIT,
      Runway incursions and pilot decision-making.
      ii. Implementation strategies should not recommend modifications to the NTSB's statutory or regulatory responsibilities to investigate accidents and determine probable cause. NTSB's findings must remain the sole determination of probable cause.
   b. Improve the quality and timelines of estimates of general aviation activity.
      i. Strategies should primarily focus on ways to improve the timeliness and accuracy of the FAA survey of GA activity.
      ii. Additionally, strategies should focus on ways to gather activity data through supplemental means and at other intervals.
   c. Suggest alternate and innovative ways to measure the effectiveness of "Safer Skies" interventions for general aviation.
2. Be co-chaired by:
   a. Ron Swanda (GAMA)
   b. (FAA-AFS)
   c. (NTSB)
3. Be composed of:
   a. (AOPA-ASF)
   b. HAI)
   c. (NBAA)
   d. (FAA-ASY)

e. (FAA-APO)
f. (NASA)
g. (NTSB)
h. Others

APPENDIX C

GADIT ACCIDENT DATA TASK PARTICIPANTS

Regular Attendees:

Deborah Bruce	-NTSB RE-10, Co-Chair
Brian Poole	-FAA AAI-220, Co-Chair
Ron Swanda	-GAMA, Co-Chair
Bob Breiling	-NBAA
Jeff Brister	-FAA AAI-220
Andrew Broom	-GAMA
Lewis Gaston	-FAA AIO-300
Jim Hallock	-TSC-DTS-67
Warren Randolph	-FAA NASDAC
Scott Shappell	-FAA-CAMI-AAM-510
Stan Smith	-NTSB RE-10
John Steuernagle	-AOPA/ASF
Bill Timberlake	-FAA ACE-100
Dean Thompson	-Raytheon Aircraft Corp.

Also Participated:

Bob Blouin	-NBAA
Bill Bramble	-NTSB-RE-10
John Carson	-AOPA/ASF
Richard Collins	-*FLYING* Magazine
Beverly Drake	-NTSB-AS-20
Brian Finnegan	-PAMA
Dave Fox	-FAA-AFS-620
Roy Fox	-Bell Helicopter-Textron
Tom Fulcher	-FAA-AIO-300
Dennis Jones	-NTSB-AS-20
David Hunter	-FAA-AAM-240
George Kobelnyk	-FAA-AAL-200
Chiquita Meier	-FAA-AFS-620
Bob Patterson	-Rockwell Collins
Theresa Payne	-FAA-ATX-400
Robin Raines	-FAA-AFS-620
David Schober	-PAMA

Vivek Sood	-FAA-NASDAC
Doug Wiegmann	-Univ. of Illinois

APPENDIX D

NTSB ACCIDENT DATA BASE

The NTSB investigates every civil aviation accident that occurs in the United States. Investigations are conducted from NTSB Headquarters in Washington, D.C. or from one of the six regional or four field offices in the United States. The regional or field offices are responsible for investigating the majority of the general aviation accidents while the headquarters NTSB personnel will lead the investigations of most of the commercial accidents. The investigations are supported by the Federal Aviation Administration and involved parties, including aircraft manufactures and engine manufacturers. After the investigation of the accident is concluded the NTSB determines the "probable cause" of the accident.

During the conduct of the investigations, the collects information about each accident and the information is entered into their accident data base. By law the NTSB is responsible for maintaining the government's database on civil aviation accidents. The NTSB Accident/Incident Database is the official repository of aviation data and causal factors. The Database was established in 1962 and approximately 2,000 new event records are added each year. It contains approximately 40,000 accidents that occurred between 1983 and the present (timeframe for most recent format). For each record, there are over 650 fields of data concerning the aircraft, event, engines, injuries, sequence of accident events and other topics.

The NTSB database is primarily composed of aircraft accidents. An "accident" is defined in 49 CFR, Part 830.2 as, "an occurrence associated with the operation of an aircraft which takes place between the time any person boards the aircraft with the intention of flight and all such persons have disembarked, and in which any person suffers death or serious injury, or in which the aircraft receives substantial damage." For example, in 2001, the NTSB investigated 1,721 general aviation accidents including 321 fatal accidents. The database also contains a select number of aviation "incidents," defined in 49 CFR, Part 830.2 as, " occurrences other than accidents that are associated with the operation of an aircraft and that affect or could affect the safety of operations."

Accident investigators use the NTSB's Accident Data Management System (ADMS) software to enter data into the Accident/Incident Database. Within 5 working days of the event, a Preliminary Report, containing a few data elements such as date, location, aircraft operator, type of aircraft, etc. becomes available. Section 49 CFR 830.5 requires the pilot/operator of the aircraft involved in the accident to file with the NTSB Regional/Field Office nearest the accident a Pilot/Operator Aircraft Accident/Incident Report, NTSB Form 6120.1, within ten (10) days of the accident. This information plus additional information the investigator collects during the investigation is recorded on a Factual Report. The Factual Report is usually entered into the ADMS within 6 to 9 months following the occurrence. A Final Report, which includes a statement of the probable cause and other contributing factors, is then completed and entered in the ADMS. Most of the information in the ADMS is accessible through the NTSB's website (www.ntsb.gov).

APPENDIX E

OTHER ACCIDENT DATA SYSTEMS

FAA's Accident/Incident Data System (AIDS)

The FAA's accident/incident data system (AIDS) contains data for general aviation accidents/incidents and air carrier incidents beginning in 1978. In 1982 air carrier accidents also started to be included. The early AIDS system gathered accident data from the NTSB Preliminary Report, Form 6120.19 and the NTSB Factual Report, Form 6120.4. Incident data was gathered from the FAA Incident Report, Form 8020.5. Some data was also taken from teletype preliminary notifications, FAA Form 8020.9. The current AIDS system still gathers some information from the NTSB Preliminary report for accidents and from FAA' Form 8020.23 for accidents and incidents.

The data is presented in a report format divided into the following categories: Location information, Aircraft Information, Operator Information, Narrative, Findings, Weather/Environmental Information, and Pilot Information. AIDS is maintained by the FAA's Flight Standards Service Aviation Data System's Branch (AFS-620) in Oklahoma City. The incident data in AIDS is accessible through the National Aviation Safety Data Analysis Center (NASDAC) web site on the FAA's web page.

FAA's NASDAC Data System

The FAA's National Aviation Safety Data Analysis Center (NASDAC) maintains an accident/incident database. The NASDAC system is not the "owner" or source of any data. Rather, it takes electronic data from diverse source systems, converts the data to a standard format and then applies search tools to the data. The data and tools are then delivered to users via Internet technology (nasdac.faa.gov). The NASDAC provides the public with the capability to access and search the entire NTSB Accident and Incident database, the Incident reports in the AIDS database and a ten year summary of world-wide fatal accidents. The NASDAC website enables users to copy or download multiple files from these databases.

AOPA Air Safety Foundation Accident Data Base

The Air Safety Foundation(ASF) of the Aircraft Owner's and Pilots Association(AOPA) maintains a data base of accidents involving fixed-wing general aviation aircraft less than 12,500 pounds maximum gross weight. Therefore, accidents involving turbojets, aircraft used in Part 121 airline, Part 135 charter, or military operations, aircraft weighing more than 12,500 pounds, helicopters, gliders, and balloons are not included. The database contains accidents back to 1995 and the source of the data is the NTSB's preliminary, final, and factual reports. The NTSB data for each accident is analyzed and classified using a simple, single-cause/factor classification scheme. The objective of using this scheme to make it easier to find lessons that can be used to prevent future accidents. The information in the database is used to develop ASF's annual Nall Report which presents information on general aviation accidents which occurred the previous year.

Robert E. Breiling Assoc. Accident Data System

Robert E. Breiling Associates Inc. has been compiling and analyzing business turbine aircraft accidents since business jet introduction in the 1960s. Their database contains detailed summaries of every reported business turbine aircraft accident grouped by aircraft series. A narrative summary of every accident that occurred worldwide since the introduction of the aircraft is included as well as information on probable cause, operational environment, crew experience, phase of flight and mechanical malfunctions.

Each year they produce an "Annual Turbine Business Aircraft Accident Review" which consolidates reliable, factual and accurate information that is available on accidents and major incidents that have occurred to business type turbine powered aircraft (jets, turbo props, and turbine helicopters) worldwide during the year. Information is obtained from numerous sources including the following: NTSB, FAA, ICAO and other world civil aviation agencies, aviation insurance companies, aviation trade associations and domestic and international trade press sources. Major incidents are also presented along with the accident information as it has become apparent that an increase in aircraft mishaps are being categorized as incidents.

APPENDIX F

NTSB FORM 6120.1/2

NATIONAL TRANSPORTATION SAFETY BOARD
NTSB Form 6120.1
PILOT/OPERATOR AIRCRAFT ACCIDENT/INCIDENT REPORT

Forms may be obtained from the National Transportation Safety Board Regional/Field Offices and the Federal Aviation Administration Flight Standards District Offices.

Rules pertaining to aircraft accidents/incidents, overdue aircraft, and safety issues are contained in Part 830 of the National Transportation Safety Board's Regulations, 49CFR. These rules state the authority of the Board, define accidents, incidents, injuries, and other terms, and provide procedures for initial and immediate notification by aircraft pilots/operators.

A. APPLICABILITY

The pilot/operator of an aircraft shall file a report with the Regional/Field Office of the National Transportation Safety Board nearest the accident or incident. **The report shall be filed within ten (10) days after an accident for which notification is required by Section 830.5 or when, after seven (7) days, an overdue aircraft is still missing.**

The Pilot/Operator Aircraft Accident/Incident Report Form is used in determining the facts, conditions, and circumstances for aircraft accident prevention activities and for statistical purposes. It is necessary that **ALL** questions be answered completely and accurately to serve the above purposes.

B. DEFINITIONS

1. "Aircraft Accident" means an occurrence associated with the operation of an aircraft that takes place between the time any person boards the aircraft with the intention of flight and all such persons have disembarked, and in which any person suffers death, or serious injury, or in which the aircraft receives substantial damage.

2. "Substantial Damage" means damage or failure which adversely affects the structural strength, performance or flight characteristics or the aircraft, and which would normally require major repair or replacement of the affected component. NOTE: Engine failure or damage limited to an engine if only one engine fails or is damaged, bent fairing or cowling, dented skin, small puncture holes in the skin or fabric, ground damage to rotor or propeller blades, and damage to landing gear, wheels, tires, flaps, engine accessories, brakes, or wing tips are not considered "substantial damage" for purposes of this report.

3. "Operator" means any person who causes or authorizes the operation of an aircraft, such as the owner, lessee, or bailee of an aircraft.

4. "Fatal Injury" means any injury that results in death within thirty (30) days of the accident.

5. "Serious Injury" means any injury that (1) requires hospitalization for more than 48 hours, commencing within 7 days from the date the injury was received: (2) results in a fracture of any bone (except simple fracture of fingers, toes, or nose): (3) causes severe hemorrhages, nerve, muscle, or tendon damage: (4) involves injury to any internal organ; or (5) involves second- or third-degree burns, or any burns affecting more than 5 percent of the body surface.

INSTRUCTIONS TO PILOTS/OPERATORS FOR COMPLETING THIS FORM

It is necessary that ALL questions on this report be answered completely and accurately.
If more space is needed, continue on a blank sheet.

Location: Use the name of the nearest community that has a Post Office in the state where the accident occurred.
Date & Time: Indicate if daylight saving or standard time.
Elevation: Provide elevation of the accident site.
Airport Identification: Provide 3 or 4 character identifier.
Runway: Direction/heading being used; surface/composition, i.e., concrete, asphalt, grass, etc.; condition-wet, slick, soft, etc.
Phase of Operation: During what phase of operation did the accident occur.

Aircraft Data: Make and Model—enter as shown on aircraft registration certificate; Engine—enter make and model as shown on engine nameplate.

Certificated Max Gross Weight—Indicate the certificated max gross weight for the aircraft involved in the occurrence.

Type of Fire Extinguishing System—Include hand type extinguishers, if fire was involved, and if the extinguisher was used.

Purpose of Flight and Type of Operation: More than one selection may be made to indicate the type of operation that was being conducted at the time of the occurrence.

Pilot Information—Pilot-in-Command (PIC) includes solo flight time. *Instructor*—indicate all dual flight instruction given.

Second Pilot Information—Indicate the capacity in which the second pilot was acting at the time of the accident.

Weather Information at the Accident/Incident Site—Indicate the weather conditions at the accident/incident site at the time of occurrence.

Sky/Lowest Cloud Condition: If cloud condition was few, scattered, broken or overcast, include height of clouds above ground level.

Restriction to Visibility: Haze, dust, smoke, fog, etc.
Type Precipitation: Rain, snow, hail, etc.

Collision Accident—This includes collision with parked aircraft or objects.

Additional Flight Crew Members—This section should be completed if there are more than two required flight crew members on the aircraft. This also includes a check airman performing official duties. State in what capacity each crewmember served.

NATIONAL TRANSPORTATION SAFETY BOARD
PILOT/OPERATOR AIRCRAFT ACCIDENT/INCIDENT REPORT

This form to be used for reporting civil and public use aircraft accidents and incidents

BASIC INFORMATION

ACCIDENT/INCIDENT LOCATION:
☐ Off Airport/Airstrip
☐ On Airport
☐ On Airstrip

ACCIDENT/INCIDENT LOCATION:
Nearest City/Place: ____________________________
State: ______________________ Zip: ____________
Latitude: __________ Longitude: ________________

DATE/TIME:
Date: ___________ Day of week: ________________
Local Time: _____ Time Zone: __________________

PHASE OF OPERATION:
☐ Standing ☐ Takeoff (including initial climb) ☐ Cruise ☐ Approach ☐ Hover/Maneuvering
☐ Taxi ☐ Climb ☐ Descent ☐ Landing ☐ Altitude of In-Flight occurrence______ Feet MSL

AIRPORT INFORMATION (**If the accident occurred on approach, takeoff or within 3 miles of an airport, complete this section**)

PROXIMITY TO AIRPORT:
☐ On Approach ☐ Downwind ☐ Final ☐ Go Around
☐ Crosswind ☐ Base leg ☐ Landing

Airport Name: ____
Identifier: ____________
Distance From Airport Center: __________ SM
Direction From Airport: _______________ Magnetic

RUNWAY/LANDING SURFACE CONDITION:
☐ Dry ☐ Snow-Crusted ☐ Rubber Deposits
☐ Wet ☐ Snow-Compacted ☐ Soft
☐ Ice Patches ☐ Vegetation ☐ Rough
☐ Ice Covered ☐ Water-Calm ☐ Slush
☐ Snow-Dry ☐ Water-Choppy ☐ Holes
☐ Snow-Wet ☐ Water-Glassy ☐ Muddy

RUNWAY INFORMATION:
Runway ID: __________________
Length: ____________________
Width: _____________________
Apt. Elev: _____________Ft. MSL

RUNWAY/LANDING SURFACE:
☐ Macadam ☐ Grass/Turf
☐ Asphalt ☐ Snow
☐ Concrete ☐ Ice
☐ Gravel ☐ Water
☐ Dirt

APPROACH INFORMATION

IFR APPROACH
☐ ADF/NDB ☐ ILS-Complete ☐ MLS ☐ Visual
☐ SDF ☐ ILS-Localizer ☐ LDA ☐ Contact
☐ VOR/TVOR ☐ ILS-Back course ☐ ASR ☐ Circling
☐ VOR/DME ☐ RNAV ☐ PAR ☐ Practice
☐ TACAN ☐ GPS ☐ Sidestep

VFR APPROACH
☐ Traffic Pattern ☐ Full Stop
☐ Straight-In ☐ Stop and Go
☐ Valley/Terrain Following ☐ Simulated Forced Landing
☐ Go Around ☐ Forced Landing
☐ Touch and Go ☐ Precautionary Landing

AIRCRAFT INFORMATION

Manufacturer: _______________________
Model: _______________________
Max Gross Wt: ___________________ Lbs
Homebuilt: ☐ Yes ☐ No
Serial No.: ______________________
Empty Wt: ____________________ Lbs

CATEGORY OF AIRCRAFT:
☐ Airplane ☐ Blimp/Dirigible
☐ Helicopter ☐ Ultralight
☐ Glider ☐ Gyroplane
☐ Balloon ☐ Other ____________

TYPE OF AIRWORTHINESS CERTIFICATE
STANDARD
☐ Normal
☐ Utility
☐ Acrobatic
☐ Transport
☐ Experimental

SPECIAL
☐ Restricted
☐ Limited
☐ Provisional
☐ Special Flight

LANDING GEAR
☐ Tricycle - Fixed ☐ Hull ☐ High Skid
☐ Tricycle - Retractable ☐ Float ☐ Tandem
☐ Tailwheel - All Fixed ☐ Emerg. Float ☐ Other ____________
☐ Tailwheel - All Retractable ☐ Ski
☐ Tailwheel - Retractable Mains ☐ Ski/Wheel
☐ Amphibian ☐ Skid

STALL WARNING SYSTEM INSTALLED
☐ Yes ☐ No

IFR EQUIPPED
☐ Yes ☐ No

ENGINE TYPE
☐ Reciprocating - Carburetor ☐ Turbo Prop ☐ Turbo Fan
☐ Reciprocating - Fuel Injected ☐ Turbo Jet ☐ Turbo Shaft
☐ Reciprocating - Turbocharged

TYPE OF PROPELLER
☐ Controllable Pitch
☐ Fixed Pitch

NUMBER OF SEATS
Flight Crew ___________________________ Passenger ____________________________
Cabin Crew ___________________________

Engine Manufacturer	**Engine Model/Series**	**Engine Rated Power**	**Type of Fire Extinguishing System Used**
		_________ Horsepower or _________ Lbs of Thrust	☐ None ☐ Specify _____________________

Engine(s)	**Date of Mfg.**	**Mfg. Serial No.**	**Total Time**	**Time Since Inspection**	**Time Since Overhaul**
Engine No. 1			Hours	Hours	Hours
Engine No. 2			Hours	Hours	Hours
Engine No. 3			Hours	Hours	Hours
Engine No. 4			Hours	Hours	Hours

Type of Maintenance Program

☐ Annual ☐ Conditional (Homebuilt)
☐ Manufacturer's Inspection Program
☐ Other Approved Inspection Program (AAIP)
☐ Continuous Airworthiness
☐ Specify ___________________

Type of Last Inspection

☐ Annual
☐ 100 Hour
☐ AAIP
☐ Continuous Airworthiness
☐ Condition Inspection

Date of Last Inspection Performed
_____________________________(M/D/Y)
Time Since Last Inspection____________ Hours

Airframe Total Time ________________ Hours

Is this total time at time of accident/incident or at the time of the last inspection?_______________
____

Emergency Locator Transmitter (ELT)	**ELT Manufacturer**	**Model/Series**	**Serial Number**	**Battery Date** (M/D/Y)
	Switch ☐ On ☐ Off ☐ Armed	**Operated** ☐ Yes ☐ No	**Aided In Accident Location** ☐ Yes ☐ No ☐ Unknown/NA	**Battery Type** (Alkaline, Lithium, etc.)

OWNER/OPERATOR INFORMATION

Registered Aircraft Owner

City ____
State ____

Operator of Aircraft

☐ Same As Registered Owner

Name ____
Doing Business As: _________________________________

City/State

☐ Same As Registered Owner

____
____

Air Carrier/Operator Designator (4 Character Designator)

Type of Operation

☐ FAR 91 ☐ FAR 125 ☐ FAR 135
☐ FAR 103 ☐ FAR 129 ☐ FAR 137
☐ FAR 121 ☐ FAR 133

FAR 121, 125, 127, 129, 135 Revenue Operations
☐ Scheduled/Commuter
☐ Non Scheduled/Air Taxi

Revenue Sightseeing Flight

☐ Yes ☐No

Purpose of Flight (FAR 91, 103, 133, 137)

☐ Personal ☐ Aerial Observation
☐ Business ☐ Other Work Use
☐ Instructional ☐ Ferry
☐ Executive/Corporate ☐ Positioning
☐ Aerial Application ☐ Other ________________

☐ Domestic
☐ International

☐ Cargo
☐ Passenger

Air Medical Flight

☐ Yes ☐ No

☐ Passenger (How many? __________)
☐ Cargo (__________________LBS.)
☐ Other (Specify) ________________

Public Use

☐ Yes ☐ No

Type of Certificate(s) Held

Air Carrier Operating Certificate
☐ Flag Carrier Operating Certificate ☐ Large Helicopter (127)
☐ Supplemental ☐ Commuter Air Carrier
☐ All Cargo (418) ☐ On-Demand Air Taxi

☐ Other Operator of Large Aircraft
☐ Rotorcraft External Load (133)
☐ Agricultural Aircraft (137)

PILOT "A" INFORMATION

Pilot Name	City/State (ONLY)	Nationality

Certificate(s)
- ☐ Student
- ☐ Private
- ☐ Recreational
- ☐ Commercial
- ☐ Airline Transport
- ☐ Flight Instructor
- ☐ Flight Engineer
- ☐ Military
- ☐ Foreign
- ☐ None
- ☐ Other _____________

Rating(s)
- ☐ None
- ☐ Single-Engine Land
- ☐ Single-Engine Sea
- ☐ Multiengine Land
- ☐ Multiengine Sea
- ☐ Helicopter
- ☐ Glider
- ☐ Free Balloon
- ☐ Airship
- ☐ Gyroplane

Instrument Rating(s)
- ☐ None
- ☐ Airplane
- ☐ Helicopter

Instructor Rating(s)
- ☐ None
- ☐ Airplane Single-Engine
- ☐ Airplane Multi-Engine
- ☐ Helicopter
- ☐ Glider
- ☐ Instrument Airplane
- ☐ Instrument Helicopter
- ☐ Ground Instructor
- ☐ Glider
- ☐ Specify _____________

Type Ratings/Student Endorsements (With Dates)

Date of Last Flight Review Or Equivalent Including FAR 121/135 Checks (M/D/Y)

Flight Review Aircraft
Make______________ Model______________

Medical Certificate
- ☐ None
- ☐ Class 1
- ☐ Class 2
- ☐ Class 3

Date of Last Medical (M/D/Y)

Limitations

Age

Waivers

Principal Occupation

Degree of Injury
- ☐ None
- ☐ Minor
- ☐ Serious
- ☐ Fatal

Seat Occupied
- ☐ Left
- ☐ Right
- ☐ Center
- ☐ Front
- ☐ Rear

Person Manipulating Controls At Time Of Accident
- ☐ First Pilot
- ☐ Second Pilot
- ☐ Both Pilots
- ☐ Non-Pilot
- ☐ No One

Who was pilot in command?

Seat Belt Available
- ☐ Yes
- ☐ No

Seat Belt Used
- ☐ Yes
- ☐ No

Shoulder Harness Available
- ☐ Yes
- ☐ No

Shoulder Harness Used
- ☐ Yes
- ☐ No

Source of Pilot Flight Time Information
- ☐ Pilot Logbook
- ☐ Pilot/Operators Estimate
- ☐ FAA Records
- ☐ Company
- ☐ Specify ___________

Flight Time	ALL A/C	This Make & Model	Airplane Single Engine	Airplane Multiengine	Night	Instrument		Rotorcraft	Glider	Lighter Than Air
						Actual	Simulated			
Total Time										
Pilot In Command (PIC)										
Instructor										
This Make/Model										
Last 90 Days										
Last 30 Days										
Last 24 Hours										

FLIGHT ITINERARY INFORMATION

Last Departure Point
Airport ID __________________
City ______________________
State ______________________

Time of Departure
Time ____________
Time Zone ________

Destination
Airport ID ________________
City _____________________
State ____________________

Flight Plan Filed
- ☐ None
- ☐ VFR
- ☐ IFR
- ☐ VFR/IFR
- ☐ Company
- ☐ Military

Type of ATC Clearance/Service
- ☐ None
- ☐ VFR
- ☐ Special VFR
- ☐ IFR
- ☐ VFR Flight Following
- ☐ VFR On Top
- ☐ Cruise
- ☐ Traffic Advisory

Airspace where the accident occurred
☐ Class A ☐ Class E ☐ Prohibited Area ☐ Student Jet Training Area
☐ Class B ☐ Class G ☐ Restricted Area ☐ TRSA
☐ Class C ☐ Demo Area ☐ Military Operating Area (MOA) ☐ FAR 93
☐ Class D ☐ Warning Area ☐ Airport Advisory Area ☐ Special

Load Description
☐ None ☐ Towing Glider ☐ Water ☐ Other ____________________
☐ Passengers ☐ Other External ☐ Chemical
☐ Cargo ☐ Parachutists ☐ Livestock

PILOT "B" INFORMATION

Pilot "B" Responsibilities at the Time of Accident
☐ Co-Pilot ☐ Dual Student ☐ Safety Pilot ☐ Check Pilot ☐ None (Pilot-Rated Passenger)

Pilot Name | **City/State (ONLY)** | **Nationality**

Certificate(s)
☐ Student ☐ Commercial ☐ Flight Instructor ☐ Military ☐ None
☐ Private ☐ Airline Transport ☐ Flight Engineer ☐ Foreign ☐ Other ___________

Rating(s)
☐ None ☐ Helicopter
☐ Single-Engine Land ☐ Glider
☐ Single-Engine Sea ☐ Free Balloon
☐ Multiengine Land ☐ Airship
☐ Multiengine Sea ☐ Gyroplane

Instrument Rating(s)
☐ None
☐ Airplane
☐ Helicopter

Instructor Rating(s)
☐ None ☐ Instrument Airplane
☐ Airplane Single-Engine ☐ Instrument Helicopter
☐ Airplane Multiengine ☐ Ground Instructor
☐ Helicopter ☐ Glider
☐ Specify ______________

Type Ratings/Student Endorsements (With Dates) | **Date of Last Flight Review Or Equivalent(M/D/Y)** | **Flight Review Aircraft** Model ______________ Make ______________

Medical Certificate
☐ None ☐ Class 2
☐ Class 1 ☐ Class 3

Date of Last Medical (M/D/Y)

Limitations

Age

Waivers

Principal Occupation

Degree of Injury
☐ None
☐ Minor
☐ Serious
☐ Fatal

Seat Occupied
☐ Left ☐ Front
☐ Right ☐ Rear
☐ Center

Person Manipulating Controls At Time Of Accident
☐ First Pilot ☐ Non-Pilot
☐ Second Pilot ☐ No One
☐ Both Pilots

Who was pilot in command?

Seat Belt Available
☐ Yes
☐ No

Seat Belt Used
☐ Yes
☐ No

Shoulder Harness Available
☐ Yes
☐ No

Shoulder Harness Used
☐ Yes
☐ No

Source of Pilot Flight Time Information
☐ Pilot Logbook ☐ Company
☐ Pilot/Operator Estimate ☐ Specify _______
☐ FAA Records

Flight Time	All A/C	This Make & Model	Airplane Single Engine	Airplane Multiengine	Night	Instrument Actual	Instrument Simulated	Rotorcraft	Glider	Lighter Than Air
Total Time										
Pilot In Command (PIC)										
Instructor										
This Make/Model										
Last 90 Days										
Last 30 Days										

Last 24 Hours										

OTHER PERSONNEL / PASSENGERS(S) (IF MORE SPACE NEEDED CONTINUE ON SEPARATE SHEET)

Name	Seat	Address (City & State)	Crew	Non-Revenue	Revenue	Non-Occupant	FAA	Fatal	Serious Injury	Minor Injury	No Injury
1.											
2.											
3.											
4.											
5.											
6.											

WEATHER INFORMATION AT THE ACCIDENT SITE

Source of Weather information (Pilot/Operator, Weather Observation Facility)

Light Condition
☐ Dawn ☐Dusk ☐ Dark Night
☐ Daylight ☐ Bright Night

Visibility
_____ Miles

Temp
____ (C)
or
____ (F)

Dew Point
_______ (C)
or
_______ (F)

Altimeter Setting
________ MB
or
________ HG

Sky/Lowest Cloud Condition
☐ Clear
☐ Few ____________________ Feet AGL
☐ Scattered _________________ Feet AGL
☐ Broken _________________ Feet AGL
☐Overcast __________________ Feet AGL
☐ Partial Obscuration
☐ Obscuration-Vertical Visibility_______________Ft. AGL

Wind Information
Direction _______True or_______ Mag
Velocity ____________________KTS
Gusts ________________________KTS

Density Altitude
____________________Feet

Intensity of Precipitation
☐ Light ☐ Heavy
☐ Moderate ☐ Specify ____________________

Restriction to Visibility
☐ None
☐ Haze
☐ Dust
☐ Smoke
☐ Fog
☐ Mist
☐ Ice Fog
☐ Ground Fog
☐ Blowing Spray
☐ Blowing Dust
☐ Blowing Snow
☐ Blowing Sand
☐ Other __________

Type of Precipitation
☐ None
☐ Rain
☐ Snow
☐ Hail
☐ Rain Showers
☐ Freezing Rain
☐ Snow Shower
☐ Drizzle
☐ Ice Pellets
☐ Snow Pellets
☐ Snow Grains
☐ Freezing Drizzle
☐ Ice Crystals
☐ Ice Pellets Shower
☐ Other ______________

Icing

FORECAST	ACTUAL
☐ None	☐ None
☐ Trace	☐ Trace
☐ Light	☐ Light
☐ Moderate	☐ Moderate
☐ Severe	☐ Severe

Source of Weather Briefing
☐ None
☐ National Weather Service
☐ Flight Service Station
☐ PATWAS/ATIS
☐ Voice Response System
☐ Other _______________
☐ Commercial Weather Service
☐ Company
☐ TV/Radio
☐ Military
☐ DUAT

Method of Briefing
☐ In Person
☐ Teletype
☐ Telephone/Computer
☐ Aircraft Radio
☐ TV/Radio

Weather Observation Facility
☐ Facility ID: ________________________________
☐ Obs Time: __________________________________
☐ Time Zone: _________________________________
☐ Distance from Accident Site: ______________________
☐ Direction from Accident Site: ____________________

Briefing Type/Completeness
☐ Standard ☐ Abbreviated ☐ Outlook
☐ Limited By Pilot ☐ Limited By Briefer ☐ Full

Turbulence (Multiple entry)
☐ None ☐ Moderate ☐ Extreme ☐ In Clouds ☐ Light Chop
☐ Light ☐ Severe ☐ Vicinity of Thunderstorm ☐ Clear Air ☐ Moderate Chop

Notams, Airmets, Sigmets

FUEL & SERVICES INFORMATION

Fuel on Board at Last Takeoff
___________________________Gallons
or
___________________________Pounds

Fuel Type
☐ 80/87 ☐ 115/145 ☐ JP3 ☐ Specify _______________
☐ 100 Low Lead ☐ Jet A ☐ JP4
☐ 100/130 ☐ Automotive ☐ JP5

Other Services, If Any, Prior to Departure

DAMAGE TO AIRCRAFT AND OTHER PROPERTY

Aircraft Damage
☐ None ☐ Substantial
☐ Minor ☐ Destroyed

Aircraft Fire
☐ None ☐ On-Ground
☐ In-Flight

Aircraft Explosion
☐ None ☐ On-Ground
☐ In-Flight

Description of Damage to Aircraft and Other Property

MECHANICAL MALFUNCTION/FAILURE (IF MORE SPACE NEEDED CONTINUE ON SEPARATE SHEET)

☐ **No**
☐ **Yes**

If yes, list the name of the part, manufacturer, part no., serial no. and describe the failure.

Total Time/Cycles On Part
______________ **Hours**

Time Since This Part Inspected/Overhauled
_______________ **Hours**

ADDITIONAL FLIGHT CREW MEMBERS

For Each Additional Flight Crew Member, Exclusive of Cabin Attendants, Complete the Following Information

Pilot (C) Name | **City/State (ONLY)** | **Crew Position**

Certificate(s)
☐ Student ☐ Commercial ☐ Flight Instructor ☐ Foreign
☐ Private ☐ Airline Transport ☐ Flight Engineer ☐ Specify _____________

Ratings/Endorsements | **Total Flight Time at the Time of This Accident/Incident**

Pilot (D) Name | **City/State (ONLY)** | **Crew Position**

Certificate(s)
☐ Student ☐ Commercial ☐ Flight Instructor ☐ Foreign
☐ Private ☐ Airline Transport ☐ Flight Engineer ☐ Specify _____________

Ratings/Endorsements | **Total Flight Time at the Time of This Accident/Incident**

Pilot (E) Name | **City/State (ONLY)** | **Crew Position**

Certificate(s)
☐ Student ☐ Commercial ☐ Flight Instructor ☐ Foreign
☐ Private ☐ Airline Transport ☐ Flight Engineer ☐ Specify _____________

Ratings/Endorsements | **Total Flight Time at the Time of This Accident/Incident**

COLLISION ACCIDENT

If Air or Ground Collision Occurred, Complete the Information for <u>Other</u> Aircraft

Registration | **Aircraft Manufacturer** | **Aircraft Make/Model**

Degree of Aircraft Damage
☐ Destroyed ☐ Minor
☐ Substantial ☐ None

Registered Aircraft Owner	City/State (ONLY)
Pilot (F) Name	**City/State (ONLY)**

EVACUATION OF AIRCRAFT

Assistance Received

☐ None ☐ Rope ☐ Specify ___________________
☐ Outside Person(s) ☐ Slide ☐ Ladder

Method of Exit
Describe which exits were used and how many passengers evacuated from each.

RECOMMENDATION (HOW COULD THIS ACCIDENT HAVE BEEN PREVENTED)

Operator/Owner Safety Recommendation (Optional)

NARRATIVE HISTORY OF FLIGHT (PLEASE TYPE OR PRINT IN INK)

Describe what occurred in chronological order, the circumstances leading to the accident and the nature of the accident. Describe the terrain and include a sketch of wreckage distribution if pertinent. Attach extra sheets if more space is needed. State point of departure, time of departure, intended destination and services obtained.

I HEREBY CERTIFY THAT THE ABOVE INFORMATION IS COMPLETE AND ACCURATE TO THE BEST OF MY KNOWLEDGE	
Date of this Report	**Signature of Pilot/Operator**

Signature of Person Filing Report If Other than Pilot/Operator

1. Signature ____________________

2. Type or Print Name ____________________

3. Title ____________________

FOR NTSB USE ONLY

NTSB Accident/Incident No.	Reviewed by NTSB Office Located At	Name of Investigator	Date Report Received

PILOT CERTIFICATE INFORMATION	
Aircraft Registration Number:	
Pilot A	**Pilot Certificate Number:**
Pilot B	**Pilot Certificate Number:**
Pilot C	**Pilot Certificate Number:**
Pilot D	**Pilot Certificate Number:**
Pilot E	**Pilot Certificate Number:**
COLLISION ACCIDENT	
If Air or Ground Collision Occurred, Complete the Information for Other Aircraft Pilot	
Aircraft Registration Number:	
Pilot F	**Pilot Certificate Number:**