System Performance Metrics

Efficiency of actual route flown

Source Torch Project

ID 9

Definition Ratio reflecting route distance saving over a single flight.

Any restrictions on use

Measure (Actual route length - Optimal route length)/Optimal route length

Perspective ATS	No	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	No	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		

Objectivity		**Validity**	
Intrusive		**Utility**	
Cost of equipment		**Expertise required**	
Reliability		**Resource intensity**	

Efficiency of route structure

Source Torch Project

ID 10

Definition Ratio reflecting efficiency of routes available for flight planning.

Any restrictions on use

Measure (Planned route length - Optimal route length)/Optimal route length

Perspective ATS	Yes	**RTS**	No	**Airport**	No
Perspective Operator	Yes	**FTS**	No	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		

Objectivity		**Validity**	
Intrusive		**Utility**	
Cost of equipment		**Expertise required**	
Reliability		**Resource intensity**	

Efficiency of routing service

Source Torch Project

ID 11

Definition Comparison of actual routing to agreed flight plan.

Any restrictions on use

Measure
1. % of flights were ATC meets agreed plan
2. (actual distance - planned distance) / planned distance
3. (actual time - planned time) / planned time
4. % of flight at non-optimal flight level

Perspective ATS	Yes	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	No	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	No	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		

Objectivity		**Validity**	
Intrusive		**Utility**	
Cost of equipment		**Expertise required**	
Reliability		**Resource intensity**	

System Performance Metrics

Route fuel average

Source dummy

Definition Route fuel saving for an operator averaged over a specified period of time/flights.

Measure Route fuel saving for an operator averaged over a specified period of time/flights.

Any restrictions on use

ID 14

Perspective ATS	No	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Route ATM charges

Source Torch Project

Definition Route charges for ATM services

Measure
1. Charge per flight
2. Charge per km flown

Any restrictions on use

ID 15

Perspective ATS	No	**RTS**	No	**Airport**	No
Perspective Operator	Yes	**FTS**	No	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Total service charges

Source Torch Project

Definition Total ATM charges for all services

Measure
1. Per service
2. Per phase of flight
3. Atributed to element (personnel cost, capital cost etc)

Any restrictions on use

ID 16

Perspective ATS	No	**RTS**	No	**Airport**	No
Perspective Operator	Yes	**FTS**	No	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

System Performance Metrics

Adherence to noise abatement procedures

Source dummy

Definition Proportion of aircraft movements achieving noise abatement routings and procedures.

Measure Proportion of aircraft movements achieving noise abatement routings and procedures.

Any restrictions on use

ID 18

Perspective ATS	Yes	**RTS**	No	**Airport**	Yes
Perspective Operator	Yes	**FTS**	No	**TMA**	Yes
Perspective ASAS	No	**Analytic**	No	**En route**	No
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Incidents (separation infringements)

Source C/AFT Study

Definition Number of separation infringements per period

Measure Number of separation infringements per period

Any restrictions on use

ID 933

Perspective ATS	Yes	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Posteriori measure of actual hazards (air-air, air

Source PRC Study

Definition Total number of accidents

Measure Total number of accidents

Any restrictions on use

ID 934

Perspective ATS	Yes	**RTS**	No	**Airport**	Yes
Perspective Operator	Yes	**FTS**	No	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	No	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

System Performance Metrics

Posteriori measure of actual hazards (air-air, air

Source PRC Study

ID 935

Definition Total number of serious incidents

Measure Total number of serious incidents

Any restrictions on use

Perspective ATS	Yes	**RTS**	No	**Airport**	Yes
Perspective Operator	Yes	**FTS**	No	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	No	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Posteriori measure of actual hazards (air-air, air

Source PRC Study

ID 936

Definition Total number of notifiable incidents

Measure Total number of notifiable incidents

Any restrictions on use

Perspective ATS	Yes	**RTS**	No	**Airport**	Yes
Perspective Operator	Yes	**FTS**	No	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	No	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Priori identification of potential hazards related

Source PRC Study

ID 937

Definition Aircraft operators' perception of ATM safety

Measure Aircraft operators' perception of ATM safety

Any restrictions on use

Perspective ATS	No	**RTS**	No	**Airport**	Yes
Perspective Operator	Yes	**FTS**	No	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	No	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

System Performance Metrics

Priori identification of potential hazards related

Source PRC Study

ID 938

Definition ATS providers' perception of ATM safety

Measure ATS providers' perception of ATM safety

Any restrictions on use

Perspective ATS	Yes	**RTS**	No	**Airport**	Yes
Perspective Operator	No	**FTS**	No	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	No	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

ATM ratio (accidents, serious incidents and oth

Source Torch Project

ID 939

Definition Number of accidents, serious incidents, other incidents where ATM contributed

Measure Number of accidents, serious incidents, other incidents where ATM contributed

Any restrictions on use

Perspective ATS	Yes	**RTS**	No	**Airport**	Yes
Perspective Operator	Yes	**FTS**	No	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	No	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Accident risk probability

Source Torch Project

ID 940

Definition Number of Hazardous event/ total of flight hours

Measure Number of Hazardous event/ total of flight hours

Any restrictions on use

Perspective ATS	Yes	**RTS**	No	**Airport**	Yes
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

System Performance Metrics

Air-misses per flight

Source Torch Project

ID 941

Definition Total number of air-misses/ total number of flights

Any restrictions on use

Measure Total number of air-misses/ total number of flights

Perspective ATS	Yes	**RTS**	No	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Air-misses per flown distance

Source Torch Project

ID 942

Definition Total number of air-misses/ total number of flown Kms.

Any restrictions on use

Measure Total number of air-misses/ total number of flown Kms.

Perspective ATS	Yes	**RTS**	No	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Air-misses per flown hour

Source Torch Project

ID 943

Definition Total number of air-misses/ total number of flown hours

Any restrictions on use

Measure Total number of air-misses/ total number of flown hours

Perspective ATS	Yes	**RTS**	No	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

System Performance Metrics

Contingency measures

Source Torch Project

Definition Total number of applied contingency measures due to any unsafe condition

Any restrictions on use

ID 944

Measure Total number of applied contingency measures due to any unsafe condition

Perspective ATS	Yes	**RTS**	No	**Airport**	Yes
Perspective Operator	Yes	**FTS**	No	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	No	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Communications coding schemes

Source

Definition Message type, message content and message subject classification coding schemes, intended for on-line recording.

Any restrictions on use

ID 1157

Measure Message type, message content and message subject classification coding schemes, intended for on-line recording.

Perspective ATS	No	**RTS**	No	**Airport**	No
Perspective Operator	No	**FTS**	No	**TMA**	No
Perspective ASAS	No	**Analytic**	No	**En route**	No
Perspective Human Perfomance	Yes	**Survey**	No		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Alerting mechanism failures (ACAS failures)

Source Torch Project

Definition Total number of false ACAS events (producing unsafe situations)

Any restrictions on use

ID 945

Measure Total number of false ACAS events (producing unsafe situations)

Perspective ATS	Yes	**RTS**	No	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

System Performance Metrics

Alerting mechanism failures (STCA failures)

Source Torch Project

ID 946

Definition Total number of false STCA events (producing unsafe situations)]

Measure Total number of false STCA events (producing unsafe situations)]

Any restrictions on use

Perspective ATS	Yes	**RTS**	No	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Alerting mechanism failures (ACAS/STCA reliab

Source Torch Project

ID 947

Definition Number of false ACAS/STCA events / number of ACAS/STCA events

Measure Number of false ACAS/STCA events / number of ACAS/STCA events

Any restrictions on use

Perspective ATS	Yes	**RTS**	No	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Alerting mechanism failures (Failure time)

Source Torch Project

ID 948

Definition Total time of system failure

Measure Total time of system failure

Any restrictions on use

Perspective ATS	Yes	**RTS**	No	**Airport**	Yes
Perspective Operator	Yes	**FTS**	No	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

System Performance Metrics

Operational errors

Source Torch Project

Definition Number of operational errors/ total number of facility activities over a selected operating time

Any restrictions on use

ID 949

Measure Number of operational errors/ total number of facility activities over a selected operating time

Perspective ATS	Yes	**RTS**	Yes	**Airport**	Yes
Perspective Operator	Yes	**FTS**	No	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	No	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

A/G communication accessibility

Source Torch Project

Definition Number of success connections/ total number of connections

Any restrictions on use

ID 950

Measure Number of success connections/ total number of connections

Perspective ATS	Yes	**RTS**	No	**Airport**	Yes
Perspective Operator	Yes	**FTS**	No	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Standard conflict en-route variable

Source FAA Study

Definition 5 miles lateral and 1.000 feet vertical (>FL290= 2.000ft vertical)

Any restrictions on use

ID 951

Measure 5 miles lateral and 1.000 feet vertical (>FL290= 2.000ft vertical)

Perspective ATS	Yes	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

System Performance Metrics

Standard conflict duration variable

Source FAA Study

Definition 5 miles lateral and 1.000 feet vertical (>FL290= 2.000ft vertical)

Measure 5 miles lateral and 1.000 feet vertical (>FL290= 2.000ft vertical)

Any restrictions on use

ID 952

Perspective ATS	Yes	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Standard conflict terminal variable

Source FAA Study

Definition 5 miles lateral and 1.000 feet vertical

Measure 5 miles lateral and 1.000 feet vertical

Any restrictions on use

ID 953

Perspective ATS	Yes	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Standard conflict cumulative duration variable

Source FAA Study

Definition 3 miles lateral and 1.000 feet vertical

Measure 3 miles lateral and 1.000 feet vertical

Any restrictions on use

ID 954

Perspective ATS	Yes	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

System Performance Metrics

User specifiable conflict, cumulative duration a

Source FAA Study

ID 955

Definition User specifiable conflict criteria for lateral and vertical separation

Measure User specifiable conflict criteria for lateral and vertical separation

Any restrictions on use

Perspective ATS	Yes	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Primary conflict measure for aircraft that are on

Source FAA Study

ID 956

Definition Measures longitudinal conflicts of aircraft on approach

Measure Measures longitudinal conflicts of aircraft on approach

Any restrictions on use

Perspective ATS	Yes	**RTS**	No	**Airport**	Yes
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	No
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

The cumulative duration of longitudinal conflict

Source FAA Study

ID 957

Definition The conflict duration in seconds

Measure The conflict duration in seconds

Any restrictions on use

Perspective ATS	Yes	**RTS**	No	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

System Performance Metrics

Parallel conflict frequency variable

Source FAA Study

Definition Frequency of conflicts between aircraft on simultaneous parallel approaches

Any restrictions on use

ID 958

Measure Frequency of conflicts between aircraft on simultaneous parallel approaches

Perspective ATS	Yes	**RTS**	No	**Airport**	Yes
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	No
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Parallel conflict frequency cumulative duration

Source FAA Study

Definition Duration of conflict for aircraft pair conflicting on simultaneous parallel approach

Any restrictions on use

ID 959

Measure Duration of conflict for aircraft pair conflicting on simultaneous parallel approach

Perspective ATS	Yes	**RTS**	No	**Airport**	Yes
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	No
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Between sector conflict frequency variable

Source FAA Study

Definition Conflict between aircraft pair when each aircraft is under control from a different controller

Any restrictions on use

ID 960

Measure Conflict between aircraft pair when each aircraft is under control from a different controller

Perspective ATS	Yes	**RTS**	No	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

System Performance Metrics

Between sector conflict frequency cumulative d

Source FAA Study

ID 961

Definition Duration of conflict between aircraft pair when each aircraft is under control from a different controller

Measure Duration of conflict between aircraft pair when each aircraft is under control from a different controller

Any restrictions on use

Perspective ATS	Yes	**RTS**	No	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Aircraft proximity index variable

Source FAA Study

ID 962

Definition A weighted measure of conflict intensity where 100 is a mid-air collision and 1 is a minor separation of the violation standards

Measure A weighted measure of conflict intensity where 100 is a mid-air collision and 1 is a minor separation of the violation standards

Any restrictions on use

Perspective ATS	Yes	**RTS**	No	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Airspace conflict frequency variable

Source FAA Study

ID 963

Definition Frequency of intrusion

Measure Frequency of intrusion

Any restrictions on use

Perspective ATS	Yes	**RTS**	No	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

System Performance Metrics

Airspace conflict frequency cumulative duratio

Source FAA Study

Definition Duration of the intrusion into restricted airspace

Any restrictions on use

ID 964

Measure Duration of the intrusion into restricted airspace

Perspective ATS	Yes	**RTS**	No	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Conflict alerts

Source FAA Study

Definition Number of conflict alerts that occurs during the simulation

Any restrictions on use

ID 965

Measure Number of conflict alerts that occurs during the simulation

Perspective ATS	Yes	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	No	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	No		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Vertical separation

Source FAA Study

Definition Vertical separation of the aircraft pair in conflict in feet

Any restrictions on use

ID 966

Measure Vertical separation of the aircraft pair in conflict in fee

Perspective ATS	Yes	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	No	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

System Performance Metrics

Closest point-of-approach

Source FAA Study

ID 967

Definition Slant range of the aircraft pair in conflict measured in feet

Any restrictions on use

Measure Slant range of the aircraft pair in conflict measured in feet

Perspective ATS	Yes	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	No	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Slant range miss distance- measure of aircraft

Source FAA Study

ID 968

Definition The shortest distance between two aircraft in conflict. It is measured by a straight line formed by the aircraft centres

Any restrictions on use

Measure The shortest distance between two aircraft in conflict. It is measured by a straight line formed by the aircraft centres

Perspective ATS	Yes	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	No	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Blunders and associated conflicts

Source FAA Study

ID 969

Definition An unexpected turn by an aircraft already established on the localizer toward another aircraft on an adjacent approach

Any restrictions on use

Measure An unexpected turn by an aircraft already established on the localizer toward another aircraft on an adjacent approach

Perspective ATS	Yes	**RTS**	Yes	**Airport**	Yes
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	No	**En route**	No
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

System Performance Metrics

Blundering aircraft and the next aircraft receivi

Source FAA Study

ID 970

Definition Planned deviations from the localizer in which one aircraft crosses into the landing path of another

Any restrictions on use

Measure Planned deviations from the localizer in which one aircraft crosses into the landing path of another

Perspective ATS	Yes	**RTS**	Yes	**Airport**	Yes
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	No	**En route**	No
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Deviation (feet, L-left, R-right), MX (maximum d

Source FAA Study

ID 971

Definition Deviation from the ILS enter line in feet

Any restrictions on use

Measure Deviation from the ILS enter line in feet

Perspective ATS	Yes	**RTS**	Yes	**Airport**	Yes
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	No	**En route**	No
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Horizontal separation (miles)- Conflicts

Source FAA Study

ID 972

Definition Horizontal separation of aircraft in conflict measured in miles

Any restrictions on use

Measure Horizontal separation of aircraft in conflict measured in miles

Perspective ATS	Yes	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

System Performance Metrics

Vertical separation (feet)- Conflicts

Source FAA Study

ID 973

Definition Vertical separation of aircraft in conflict measured in feet

Measure Vertical separation of aircraft in conflict measured in feet

Any restrictions on use

Perspective ATS	Yes	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Number of non-solved conflicts

Source MAICA project

ID 974

Definition It is the number of conflicts that the resolution algorithm was not able to solve

Measure It is the number of conflicts that the resolution algorithm was not able to solve

Any restrictions on use

Perspective ATS	Yes	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Number of missed resolutions

Source MAICA project

ID 975

Definition Total number of resolution attempts which have failed

Measure Total number of resolution attempts which have failed

Any restrictions on use

Perspective ATS	Yes	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

System Performance Metrics

Number of conflicts with missed resolution atte

Source MAICA project

Definition The number of conflicts which were solved after more than one attempt and the number of attempts

Any restrictions on use

ID 976

Measure The number of conflicts which were solved after more than one attempt and the number of attempts

Perspective ATS	Yes	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Number of class 1 resolutions

Source MAICA project

Definition The number of conflicts which have been solved using a solution allowing to return before the end of the resolution period to a trajectory leading to the exit point

Any restrictions on use

ID 977

Measure The number of conflicts which have been solved using a solution allowing to return before the end of the resolution period to a trajectory leading to the exit point

Perspective ATS	Yes	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Number of class 2 resolutions

Source MAICA project

Definition The number of conflicts that a class 1 resolution has not been able to solve

Any restrictions on use

ID 978

Measure The number of conflicts that a class 1 resolution has not been able to solve

Perspective ATS	Yes	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

System Performance Metrics

Number of lateral resolutions

Source MAICA project

Definition Number of conflicts that have been solved using only lateral manoeuvres

Measure Number of conflicts that have been solved using only lateral manoeuvres

Any restrictions on use

ID 979

Perspective ATS	Yes	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Number of vertical resolutions

Source MAICA project

Definition Number of conflicts that have been solved using only vertical manoeuvres

Measure Number of conflicts that have been solved using only vertical manoeuvres

Any restrictions on use

ID 980

Perspective ATS	Yes	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Number of aircraft taken into account for a reso

Source MAICA project

Definition For each resolution, the number of aircraft that the one in charge of it had to take into account

Measure For each resolution, the number of aircraft that the one in charge of it had to take into account

Any restrictions on use

ID 981

Perspective ATS	Yes	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

System Performance Metrics

Resolution complexity

Source MAICA project

ID 982

Definition The number of manoeuvres required to solve a conflict

Any restrictions on use

Measure The number of manoeuvres required to solve a conflict

Perspective ATS	Yes	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Number of illegal horizontal exit

Source MAICA project

ID 983

Definition The number of aircraft which have left the space outside the horizontal tolerance around the exit point

Any restrictions on use

Measure The number of aircraft which have left the space outside the horizontal tolerance around the exit point

Perspective ATS	Yes	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Number of illegal vertical exit

Source MAICA project

ID 984

Definition The number of aircraft which have left the space outside the vertical tolerance around the exit point

Any restrictions on use

Measure The number of aircraft which have left the space outside the vertical tolerance around the exit point

Perspective ATS	Yes	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

System Performance Metrics

Detected "convergence" conflicts versus FL

Source MAICA project

ID 985

Definition These conflicts can either be "convergences" or "overtakes" or "headons"

Measure These conflicts can either be "convergences" or "overtakes" or "headons"

Any restrictions on use

Perspective ATS	Yes	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Total number of detected conflicts in ADS-B ra

Source MAICA project

ID 986

Definition It is considered that a conflict becomes "visible" when the other aircraft involved is within ADSB-range and when it has received the predicted trajectory of this aircraft till the conflict start time (look-ahead time)

Measure Total number of detected conflicts in ADS-B range versus FL

Any restrictions on use

Perspective ATS	Yes	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Simultaneously detected conflicts in ADS-B ran

Source MAICA project

ID 987

Definition The number of conflicts which are currently visible by each aircraft for each FL

Measure The number of conflicts which are currently visible by each aircraft for each FL

Any restrictions on use

Perspective ATS	Yes	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

System Performance Metrics

Active conflict resolution versus flight level

Source MAICA project

Definition Number of conflicts solved by a particular aircraft (depending on the altitude of both aircraft)

Measure Number of conflicts solved by a particular aircraft (depending on the altitude of both aircraft)

Any restrictions on use

ID 988

Perspective ATS	Yes	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Time between a conflict detection and resolutio

Source MAICA project

Definition The time between the detection of the conflict by the aircraft involved and the first resolution attempt

Measure The time between the detection of the conflict by the aircraft involved and the first resolution attempt

Any restrictions on use

ID 989

Perspective ATS	Yes	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Time between conflict resolution and beginning

Source MAICA project

Definition The difference between the conflict resolution time and its beginning time

Measure The difference between the conflict resolution time and its beginning time

Any restrictions on use

ID 990

Perspective ATS	Yes	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

System Performance Metrics

Time between active resolutions

Source MAICA project

Definition For an aircraft, it is the flight duration divided by the number of actively solved conflicts

Measure Aircraft flight duration divided by the number of actively solved conflicts

Any restrictions on use

ID 991

Perspective ATS	Yes	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Cluster density versus size, expressed in numb

Source MAICA project

Definition Number of clusters present in the air situation sorted by size expressed in number of aircraft

Measure Number of clusters present in the air situation sorted by size expressed in number of aircraft

Any restrictions on use

ID 992

Perspective ATS	Yes	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Cluster density versus size, expressed in numb

Source MAICA project

Definition Number of clusters present in the air situation sorted by size expressed in number of conflicts

Measure Number of clusters present in the air situation sorted by size expressed in number of conflicts

Any restrictions on use

ID 993

Perspective ATS	Yes	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

System Performance Metrics

Number of induced conflicts

Source MAICA project

Definition Number of conflicts that start while the aircraft has not yet finished the resolution of the previous one

Measure Number of conflicts that start while the aircraft has not yet finished the resolution of the previous one

Any restrictions on use

ID 994

Perspective ATS	Yes	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Time before induced conflicts resolution

Source MAICA project

Definition The time between the beginning of the resolution of this conflict and the beginning of the resolution under progress

Measure The time between the beginning of the resolution of this conflict and the beginning of the resolution under progress

Any restrictions on use

ID 995

Perspective ATS	Yes	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Taxi-in delay

Source C/AFT Study

Definition Difference between actual taxi-in time and minimum taxi-in time filed in flight plan

Measure Difference between actual taxi-in time and minimum taxi-in time filed in flight plan

Any restrictions on use

ID 996

Perspective ATS	Yes	**RTS**	Yes	**Airport**	Yes
Perspective Operator	Yes	**FTS**	Yes	**TMA**	No
Perspective ASAS	No	**Analytic**	Yes	**En route**	No
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

System Performance Metrics

Taxi-out delay

Source C/AFT Study

ID 997

Definition Difference between actual taxi-out time and minimum taxi-out time

Measure Difference between actual taxi-out time and minimum taxi-out time

Any restrictions on use

Perspective ATS	Yes	**RTS**	Yes	**Airport**	Yes
Perspective Operator	Yes	**FTS**	Yes	**TMA**	No
Perspective ASAS	No	**Analytic**	Yes	**En route**	No
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

ATC delays

Source C/AFT Study

ID 998

Definition Number, deviation and impact of ground delays imposed by the air traffic control system

Measure Number, deviation and impact of ground delays imposed by the air traffic control system

Any restrictions on use

Perspective ATS	Yes	**RTS**	No	**Airport**	Yes
Perspective Operator	Yes	**FTS**	No	**TMA**	Yes
Perspective ASAS	No	**Analytic**	No	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Total delay

Source C/AFT Study

ID 999

Definition Total delay

Measure Total delay

Any restrictions on use

Perspective ATS	Yes	**RTS**	No	**Airport**	Yes
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

System Performance Metrics

Flights delayed

Source C/AFT Study

Definition Number of flights delayed

Measure Number of flights delayed

Any restrictions on use

ID 1000

Perspective ATS	Yes	**RTS**	No	**Airport**	Yes
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Average delay

Source C/AFT Study

Definition Average delay per flight (total, airborne, gate, taxi-in…)

Measure Average delay per flight (total, airborne, gate, taxi-in…)

Any restrictions on use

ID 1001

Perspective ATS	Yes	**RTS**	No	**Airport**	Yes
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Causes of delays

Source C/AFT Study

Definition Percentage of flights delayed (total, airborne, gate, taxi-in…)

Measure Percentage of flights delayed

Any restrictions on use

ID 1002

Perspective ATS	Yes	**RTS**	No	**Airport**	Yes
Perspective Operator	Yes	**FTS**	No	**TMA**	Yes
Perspective ASAS	No	**Analytic**	No	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

System Performance Metrics

CFMU delay (overall)

Source C/AFT Study

ID 1003

Definition CFMU overall delay

Measure CFMU overall delay

Any restrictions on use

Perspective ATS	Yes	**RTS**	No	**Airport**	No
Perspective Operator	Yes	**FTS**	No	**TMA**	No
Perspective ASAS	Yes	**Analytic**	No	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

CFMU delay (peak)

Source C/AFT Study

ID 1004

Definition CFMU peak delay

Measure CFMU peak delay

Any restrictions on use

Perspective ATS	Yes	**RTS**	No	**Airport**	No
Perspective Operator	Yes	**FTS**	No	**TMA**	No
Perspective ASAS	Yes	**Analytic**	No	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

CODA delay (overall)

Source C/AFT Study

ID 1005

Definition CODA overall delay

Measure CODA overall delay

Any restrictions on use

Perspective ATS	Yes	**RTS**	No	**Airport**	Yes
Perspective Operator	Yes	**FTS**	No	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	No	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

System Performance Metrics

CODA delay (most affected traffic)

Source C/AFT Study

ID 1006

Definition Most affected traffic flows

Measure Most affected traffic flows

Any restrictions on use

Perspective ATS	Yes	**RTS**	No	**Airport**	No
Perspective Operator	Yes	**FTS**	No	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	No	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

CODA, CFMU reports (departure delays)

Source PRC Study

ID 1007

Definition Capacity vs. Demand

Measure Capacity vs. Demand

Any restrictions on use

Perspective ATS	Yes	**RTS**	No	**Airport**	Yes
Perspective Operator	Yes	**FTS**	No	**TMA**	Yes
Perspective ASAS	No	**Analytic**	No	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Departure delay (by total flights)

Source PRC Study

ID 1008

Definition Total minutes of departure delay/ total number of flights

Measure (actual off-block time vs. Scheduled departure time) / total number of flights

Any restrictions on use

Perspective ATS	Yes	**RTS**	Yes	**Airport**	Yes
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	No	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

System Performance Metrics

Departure delay (proportion of flights delayed)

Source PRC Study

Definition Total number of delayed flights/ total number of flights

Any restrictions on use

ID 1009

Measure Total number of delayed flights/ total number of flights

Perspective ATS	Yes	**RTS**	Yes	**Airport**	Yes
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	No	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Departure delay (by delayed flights)

Source PRC Study

Definition Total minutes of departure delay/ number of delayed flights

Any restrictions on use

ID 1010

Measure (actual off-block time vs. Scheduled departure time) / number of delayed flights

Perspective ATS	Yes	**RTS**	Yes	**Airport**	Yes
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	No	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Flight delay (delays on the ground before take-

Source PRC Study

Definition Total minutes of gate-to-gate delay/ total number of flights

Any restrictions on use

ID 1011

Measure Total minutes of gate-to-gate delay/ total number of flights

Perspective ATS	Yes	**RTS**	Yes	**Airport**	Yes
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

System Performance Metrics

TMA delay (between the arrival fix and the touc

Source PRC Study

ID 1012

Definition Total minutes of TMA delay/ total number of flights

Any restrictions on use

Measure Total minutes of TMA delay/ total number of flights

Perspective ATS	Yes	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	No
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Arrival delay (function of departure delays and f

Source PRC Study

ID 1013

Definition Total minutes of arrival delay/ total number of flights

Any restrictions on use

Measure Total minutes of arrival delay/ total number of flights

Perspective ATS	Yes	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Causes of delay (ATM, aircraft operator, airport)

Source PRC Study

ID 1014

Definition Proportion of total delay arising from each identified cause

Any restrictions on use

Measure Proportion of total delay arising from each identified cause

Perspective ATS	Yes	**RTS**	No	**Airport**	Yes
Perspective Operator	Yes	**FTS**	No	**TMA**	Yes
Perspective ASAS	No	**Analytic**	No	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

System Performance Metrics

Relationship among delay, traffic volume and c

Source PRC Study

Definition Weekly minutes of ATM delay by volume of traffic

Measure Weekly minutes of ATM delay by volume of traffic

Any restrictions on use

ID 1015

Perspective ATS	Yes	**RTS**	No	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Capacity management (index)

Source PRC Study

Definition Capacity index

Measure Capacity index

Any restrictions on use

ID 1016

Perspective ATS	Yes	**RTS**	No	**Airport**	Yes
Perspective Operator	No	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Capacity management (target variation)

Source PRC Study

Definition Actual capacity variation/ target capacity variation (%)

Measure Actual capacity variation/ target capacity variation (%)

Any restrictions on use

ID 1017

Perspective ATS	Yes	**RTS**	Yes	**Airport**	Yes
Perspective Operator	No	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

System Performance Metrics

Capacity management (traffic variation)

Source PRC Study

ID 1018

Definition Actual capacity variation/ actual traffic variation (%)

Measure Actual capacity variation/ actual traffic variation (%)

Any restrictions on use

Perspective ATS	Yes	**RTS**	Yes	**Airport**	Yes
Perspective Operator	No	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Flight delay

Source Torch Project

ID 1019

Definition Difference between actual and optimum gate to gate time in minutes (for each phase of flight)]

Measure Difference between actual and optimum gate to gate time in minutes (for each phase of flight)]

Any restrictions on use

Perspective ATS	Yes	**RTS**	Yes	**Airport**	Yes
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Causes of flight delays

Source Torch Project

ID 1020

Definition Duration of delay by causes of delay

Measure Duration of delay by causes of delay

Any restrictions on use

Perspective ATS	Yes	**RTS**	No	**Airport**	Yes
Perspective Operator	Yes	**FTS**	No	**TMA**	Yes
Perspective ASAS	No	**Analytic**	No	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

System Performance Metrics

ATFM delay

Source Torch Project

Definition Delays due to flow restrictions

Measure Delays due to flow restrictions

Any restrictions on use

ID 1021

Perspective ATS	Yes	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	No
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

ATC delays

Source Torch Project

Definition Total number of flights delayed by ATC causes/ total number of flights

Measure Total number of flights delayed by ATC causes/ total number of flights

Any restrictions on use

ID 1022

Perspective ATS	Yes	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Ground delays

Source Torch Project

Definition Total number of gate delays/ total number of airport arrivals over a selected operating time

Measure Total number of gate delays/ total number of airport arrivals over a selected operating time

Any restrictions on use

ID 1023

Perspective ATS	Yes	**RTS**	Yes	**Airport**	Yes
Perspective Operator	Yes	**FTS**	Yes	**TMA**	No
Perspective ASAS	No	**Analytic**	Yes	**En route**	No
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

System Performance Metrics

Record of time

Source ECAC experiments on ASAS

ID 1024

Definition Measure of total flight time with and without delegation

Any restrictions on use

Measure Measure of total flight time with and without delegation

Perspective ATS	No	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Initial trajectory duration

Source MAICA project

ID 1025

Definition The duration required to fly the initial trajectory

Any restrictions on use

Measure The duration required to fly the initial trajectory

Perspective ATS	No	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	No		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Real trajectory duration

Source MAICA project

ID 1026

Definition This is the real duration of a flight

Any restrictions on use

Measure Real trajectory duration

Perspective ATS	No	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

System Performance Metrics

Duration increase

Source MAICA project

Definition This is the ratio: real trajectory duration divided by initial trajectory duration

Any restrictions on use

ID 1027

Measure real trajectory duration divided by initial trajectory duration

Perspective ATS	No	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Delay before creation

Source MAICA project

Definition The trajectory to be created must be free of conflicts during some time. If not, the creation is delayed

Any restrictions on use

ID 1028

Measure Delay before creation

Perspective ATS	Yes	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	No
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Diversions due to weather

Source C/AFT Study

Definition Number of diversions (segments) recorded due to bad weather

Any restrictions on use

ID 1029

Measure Number of diversions (segments) recorded due to bad weather

Perspective ATS	Yes	**RTS**	No	**Airport**	Yes
Perspective Operator	Yes	**FTS**	No	**TMA**	Yes
Perspective ASAS	No	**Analytic**	No	**En route**	No
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

System Performance Metrics

Cancellations due to weather

Source C/AFT Study

Definition Number of cancellations recorded due to weather

Measure Number of cancellations recorded due to weather

Any restrictions on use

ID 1030

Perspective ATS	Yes	**RTS**	No	**Airport**	Yes
Perspective Operator	Yes	**FTS**	No	**TMA**	Yes
Perspective ASAS	No	**Analytic**	No	**En route**	No
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Misconnects due to weather

Source C/AFT Study

Definition Number of passenger misconnects recorded due to weather

Measure Number of passenger misconnects recorded due to weather

Any restrictions on use

ID 1031

Perspective ATS	No	**RTS**	No	**Airport**	Yes
Perspective Operator	Yes	**FTS**	No	**TMA**	Yes
Perspective ASAS	No	**Analytic**	No	**En route**	No
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Variations in system performance associated w

Source C/AFT Study

Definition Difference between highest EPS VFR capacity and smallest CAT I IFR capacity

Measure Difference between highest EPS VFR capacity and smallest CAT I IFR capacity

Any restrictions on use

ID 1032

Perspective ATS	Yes	**RTS**	Yes	**Airport**	Yes
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	No
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

System Performance Metrics

Variations in system performance associated w

Source C/AFT Study

ID 1033

Definition Dispersion in daily average taxi-in times and taxi-out times

Measure Dispersion in daily average taxi-in times and taxi-out times

Any restrictions on use

Perspective ATS	Yes	**RTS**	No	**Airport**	Yes
Perspective Operator	Yes	**FTS**	No	**TMA**	No
Perspective ASAS	No	**Analytic**	No	**En route**	No
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Variations in system performance associated w

Source C/AFT Study

ID 1034

Definition Dispersion in expected arrival time vs. Actual arrival times

Measure Dispersion in expected arrival time vs. Actual arrival times

Any restrictions on use

Perspective ATS	Yes	**RTS**	Yes	**Airport**	Yes
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Variation in the ATM system as experienced by

Source C/AFT Study

ID 1035

Definition Timeliness and quality of data provided to the user on weather, traffic and system status

Measure Timeliness and quality of data provided to the user on weather, traffic and system status

Any restrictions on use

Perspective ATS	No	**RTS**	Yes	**Airport**	Yes
Perspective Operator	Yes	**FTS**	No	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	No	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

System Performance Metrics

Variation in the ATM system as experienced by

Source C/AFT Study

Definition Number of delay allocation decisions made with direct user input

Measure Number of delay allocation decisions made with direct user input

Any restrictions on use

ID 1036

Perspective ATS	No	**RTS**	Yes	**Airport**	Yes
Perspective Operator	Yes	**FTS**	No	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	No	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Impact of system outages

Source C/AFT Study

Definition Number of cancellations and diversions at major airports within the affected area

Measure Number of cancellations and diversions at major airports within the affected area

Any restrictions on use

ID 1037

Perspective ATS	Yes	**RTS**	No	**Airport**	Yes
Perspective Operator	Yes	**FTS**	No	**TMA**	Yes
Perspective ASAS	No	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Impact of system outages

Source C/AFT Study

Definition Total delay of departures (impact of system outages) [a measure the variation in the ATM system as experienced by the user]

Measure Total delay of departures

Any restrictions on use

ID 1038

Perspective ATS	Yes	**RTS**	No	**Airport**	Yes
Perspective Operator	Yes	**FTS**	No	**TMA**	Yes
Perspective ASAS	No	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

System Performance Metrics

Impact of system outages

Source C/AFT Study

Definition Total difference between scheduled and actual arrival times

Any restrictions on use

ID 1039

Measure Total difference between scheduled and actual arrival times

Perspective ATS	Yes	**RTS**	No	**Airport**	Yes
Perspective Operator	Yes	**FTS**	No	**TMA**	Yes
Perspective ASAS	No	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Anticipated delay

Source PRC Study

Definition Difference between scheduled and optimum gate-to-gate time

Any restrictions on use

ID 1040

Measure Difference between scheduled and optimum gate-to-gate time

Perspective ATS	Yes	**RTS**	Yes	**Airport**	Yes
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Standard deviation

Source PRC Study

Definition Standard deviation of arrival delay

Any restrictions on use

ID 1041

Measure Standard deviation of arrival delay

Perspective ATS	No	**RTS**	Yes	**Airport**	Yes
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

System Performance Metrics

Components (arrival delay)

Source PRC Study

ID 1042

Definition Standard deviation of each delay component

Measure Standard deviation of each delay component

Any restrictions on use

Perspective ATS	Yes	**RTS**	Yes	**Airport**	Yes
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Causes (arrival delay)

Source PRC Study

ID 1043

Definition Causes of delay in each delay component

Measure Causes of delay in each delay component

Any restrictions on use

Perspective ATS	Yes	**RTS**	Yes	**Airport**	Yes
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Taxi-in variation (variability in arrival delay)

Source PRC Study

ID 1044

Definition Taxi-in variation time

Measure Taxi-in variation time

Any restrictions on use

Perspective ATS	Yes	**RTS**	Yes	**Airport**	Yes
Perspective Operator	Yes	**FTS**	Yes	**TMA**	No
Perspective ASAS	No	**Analytic**	Yes	**En route**	No
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

System Performance Metrics

Taxi-out variation (variability in arrival delay)

Source PRC Study

Definition Taxi-out variation time

Any restrictions on use

ID 1045

Measure Taxi-out variation time

Perspective ATS	Yes	**RTS**	Yes	**Airport**	Yes
Perspective Operator	Yes	**FTS**	Yes	**TMA**	No
Perspective ASAS	No	**Analytic**	Yes	**En route**	No
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Punctuality of arrival

Source Torch Project

Definition Difference between actual and scheduled arrival time

Any restrictions on use

ID 1046

Measure Difference between actual and scheduled arrival time

Perspective ATS	No	**RTS**	Yes	**Airport**	Yes
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Anticipated delay

Source Torch Project

Definition Difference between schedule and optimum gate to gate time in minutes

Any restrictions on use

ID 1047

Measure Difference between schedule and optimum gate to gate time in minutes

Perspective ATS	No	**RTS**	Yes	**Airport**	Yes
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

System Performance Metrics

Cancel flight- instantaneous aircraft count

Source FAA Study

Definition Number of cancelled flights that occurred during an experimental run

Measure Number of cancelled flights that occurred during an experimental run

Any restrictions on use

ID 1048

Perspective ATS	Yes	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	No
Perspective ASAS	Yes	**Analytic**	No	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	No		

Objectivity		**Validity**	
Intrusive		**Utility**	
Cost of equipment		**Expertise required**	
Reliability		**Resource intensity**	

Approved approaches

Source C/AFT Study

Definition Number of airports with approved approaches

Measure Number of airports with approved approaches

Any restrictions on use

ID 1049

Perspective ATS	Yes	**RTS**	Yes	**Airport**	Yes
Perspective Operator	Yes	**FTS**	Yes	**TMA**	No
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	No
Perspective Human Perfomance	No	**Survey**	Yes		

Objectivity		**Validity**	
Intrusive		**Utility**	
Cost of equipment		**Expertise required**	
Reliability		**Resource intensity**	

Special use airspace access

Source C/AFT Study

Definition Percentage of air carrier flights that penetrate special use airspace, for those origin-destination pairs in which at least one flight penetrated special use airspace

Measure Percentage of air carrier flights that penetrate special use airspace, for those origin-destination pairs in which at least one flight penetrated special use airspace

Any restrictions on use

ID 1050

Perspective ATS	Yes	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		

Objectivity		**Validity**	
Intrusive		**Utility**	
Cost of equipment		**Expertise required**	
Reliability		**Resource intensity**	

System Performance Metrics

Airport capacity utilisation (average)

Source C/AFT Study

ID 1051

Definition Average demand to capacity ratio

Any restrictions on use

Measure Average demand to capacity ratio

Perspective ATS	Yes	**RTS**	Yes	**Airport**	Yes
Perspective Operator	No	**FTS**	Yes	**TMA**	No
Perspective ASAS	No	**Analytic**	Yes	**En route**	No
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Airport capacity utilisation (average)

Source C/AFT Study

ID 1052

Definition Peak demand to capacity ratio

Any restrictions on use

Measure Peak demand to capacity ratio

Perspective ATS	Yes	**RTS**	Yes	**Airport**	Yes
Perspective Operator	No	**FTS**	Yes	**TMA**	No
Perspective ASAS	No	**Analytic**	Yes	**En route**	No
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Airport capacity

Source C/AFT Study

ID 1053

Definition Airport capacity per period of time under different runway configurations, weather conditions and procedures

Any restrictions on use

Measure Airport capacity per period of time under different runway configurations, weather conditions and procedures

Perspective ATS	Yes	**RTS**	Yes	**Airport**	Yes
Perspective Operator	No	**FTS**	Yes	**TMA**	No
Perspective ASAS	No	**Analytic**	Yes	**En route**	No
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

System Performance Metrics

Sector capacity

Source C/AFT Study

ID 1054

Definition Sector capacity per period of time under different weather conditions and procedures

Measure Sector capacity per period of time under different weather conditions and procedures

Any restrictions on use

Perspective ATS	Yes	**RTS**	Yes	**Airport**	No
Perspective Operator	No	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Availability of airspace (access to sectors, pref

Source PRC Study

ID 1055

Definition Number of aircraft operator preferred routes accepted/ number of flight plans submitted

Measure Number of aircraft operator preferred routes accepted/ number of flight plans submitted

Any restrictions on use

Perspective ATS	Yes	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	No
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Availability of airport capacity (peak hours)

Source PRC Study

ID 1056

Definition Aircraft movements at peak hours/ declared capacity

Measure Aircraft movements at peak hours/ declared capacity

Any restrictions on use

Perspective ATS	Yes	**RTS**	Yes	**Airport**	Yes
Perspective Operator	No	**FTS**	Yes	**TMA**	No
Perspective ASAS	No	**Analytic**	Yes	**En route**	No
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

System Performance Metrics

Availability of airport capacity (unconstrained r

Source PRC Study

ID 1057

Definition Declared capacity/ unconstrained runway capacity

Measure Declared capacity/ unconstrained runway capacity

Any restrictions on use

Perspective ATS	Yes	**RTS**	Yes	**Airport**	Yes
Perspective Operator	No	**FTS**	Yes	**TMA**	No
Perspective ASAS	No	**Analytic**	Yes	**En route**	No
Perspective Human Perfomance	No	**Survey**	Yes		

Objectivity		**Validity**	
Intrusive		**Utility**	
Cost of equipment		**Expertise required**	
Reliability		**Resource intensity**	

Availability of airport capacity (peak hour dema

Source PRC Study

ID 1058

Definition Peak hour demand/ scheduled peak hour capacity

Measure Peak hour demand/ scheduled peak hour capacity

Any restrictions on use

Perspective ATS	Yes	**RTS**	Yes	**Airport**	Yes
Perspective Operator	No	**FTS**	Yes	**TMA**	No
Perspective ASAS	No	**Analytic**	Yes	**En route**	No
Perspective Human Perfomance	No	**Survey**	Yes		

Objectivity		**Validity**	
Intrusive		**Utility**	
Cost of equipment		**Expertise required**	
Reliability		**Resource intensity**	

Availability of airspace for military purposes (n

Source PRC Study

ID 1059

Definition % Time a given restricted airspace is not available for planned missions

Measure % Time a given restricted airspace is not available for planned missions

Any restrictions on use

Perspective ATS	Yes	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		

Objectivity		**Validity**	
Intrusive		**Utility**	
Cost of equipment		**Expertise required**	
Reliability		**Resource intensity**	

System Performance Metrics

Availability of airspace for military purposes (n

Source PRC Study

Definition % Time a given restricted area is available and not used

Any restrictions on use

ID 1060

Measure % Time a given restricted area is available and not used

Perspective ATS	Yes	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Availability of routes

Source Torch Project

Definition Number of company preferred route accepted/ number of flight plans accepted

Any restrictions on use

ID 1061

Measure Number of company preferred route accepted/ number of flight plans accepted

Perspective ATS	Yes	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	No
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Company preferred routes accepted

Source Torch Project

Definition Number of company preferred routes accepted/ number of flight plans accepted

Any restrictions on use

ID 1062

Measure Number of company preferred routes accepted/ number of flight plans accepted

Perspective ATS	Yes	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	No
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

System Performance Metrics

Availability of airport capacity

Source Torch Project

Definition Availability of airport capacity

Measure Availability of airport capacity

Any restrictions on use

ID 1063

Perspective ATS	Yes	**RTS**	Yes	**Airport**	Yes
Perspective Operator	Yes	**FTS**	Yes	**TMA**	No
Perspective ASAS	No	**Analytic**	Yes	**En route**	No
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Movements

Source Torch Project

Definition Number of movements/ declared capacity

Measure Number of movements/ declared capacity

Any restrictions on use

ID 1064

Perspective ATS	Yes	**RTS**	Yes	**Airport**	Yes
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Unconstrained runway capacity

Source Torch Project

Definition Declared capacity/ unconstrained runway capacity

Measure Declared capacity/ unconstrained runway capacity

Any restrictions on use

ID 1065

Perspective ATS	Yes	**RTS**	Yes	**Airport**	Yes
Perspective Operator	Yes	**FTS**	Yes	**TMA**	No
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	No
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

System Performance Metrics

Saturation capacity (airport)

Source Torch Project

ID 1066

Definition Number of total actual hourly operations/ number of maximum operations (saturation capacity)

Measure Number of total actual hourly operations/ number of maximum operations (saturation capacity)

Any restrictions on use

Perspective ATS	Yes	**RTS**	Yes	**Airport**	Yes
Perspective Operator	Yes	**FTS**	Yes	**TMA**	No
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	No
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Practical capacity (airport)

Source Torch Project

ID 1067

Definition Practical capacity (airport capacity)

Measure Practical capacity (airport capacity)

Any restrictions on use

Perspective ATS	Yes	**RTS**	Yes	**Airport**	Yes
Perspective Operator	Yes	**FTS**	Yes	**TMA**	No
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	No
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Capacity per sector

Source Torch Project

ID 1068

Definition Number of maximum handled aircraft simultaneously by sector

Measure Number of maximum handled aircraft simultaneously by sector

Any restrictions on use

Perspective ATS	Yes	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

System Performance Metrics

Sector capacity per hour

Source Torch Project

Definition Number of maximum handled aircraft in an hour by sector

Any restrictions on use

ID 1069

Measure Number of maximum handled aircraft in an hour by sector

Perspective ATS	Yes	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Sector capacity per unit of time

Source Torch Project

Definition Number of handled aircraft in an unit of time by sector

Any restrictions on use

ID 1070

Measure Number of handled aircraft in an unit of time by sector

Perspective ATS	Yes	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Traffic density

Source Torch Project

Definition Total number of flown NM/ square NM of airspace (area)

Any restrictions on use

ID 1071

Measure Total number of flown NM/ square NM of airspace (area)

Perspective ATS	Yes	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

System Performance Metrics

ATM restrictions (flow)

Source Torch Project

Definition Number of total flow of restriction areas ATM restrictions

Any restrictions on use

ID 1072

Measure Number of total flow of restriction areas ATM restrictions

Perspective ATS	Yes	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

ATM restrictions (average time)

Source Torch Project

Definition Average time of restrictions

Any restrictions on use

ID 1073

Measure Average time of restrictions

Perspective ATS	Yes	**RTS**	Yes	**Airport**	Yes
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Missed approaches- non conflict errors

Source FAA Study

Definition Frequency of missed approaches executed during a run

Any restrictions on use

ID 1074

Measure Frequency of missed approaches executed during a run

Perspective ATS	Yes	**RTS**	Yes	**Airport**	Yes
Perspective Operator	Yes	**FTS**	Yes	**TMA**	No
Perspective ASAS	Yes	**Analytic**	No	**En route**	No
Perspective Human Perfomance	No	**Survey**	No		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

System Performance Metrics

Landings

Source FAA Study

Definition The number of landings that occurred during an experimental run

Any restrictions on use

ID 1075

Measure The number of landings that occurred during an experimental run

Perspective ATS	Yes	**RTS**	Yes	**Airport**	Yes
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	No	**En route**	No
Perspective Human Perfomance	No	**Survey**	No		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Departures

Source FAA Study

Definition The number of departures that occurred during an experimental run

Any restrictions on use

ID 1076

Measure The number of departures that occurred during an experimental run

Perspective ATS	Yes	**RTS**	Yes	**Airport**	Yes
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	No	**En route**	No
Perspective Human Perfomance	No	**Survey**	No		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Sector size

Source FAA Study

Definition This is the square mileage a sector takes

Any restrictions on use

ID 1077

Measure Square miles

Perspective ATS	Yes	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	No	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

System Performance Metrics

Number of intersecting flight paths

Source FAA Study

ID 1078

Definition This is the number of routes or victor airways that cross within the sector

Measure The number of routes or victor airways that cross within the sector

Any restrictions on use

Perspective ATS	Yes	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	No
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Aircraft in sequence

Source ECAC experiments on ASAS

ID 1079

Definition Percentage of aircraft in sequence within the TMA

Measure Percentage of aircraft in sequence within the TMA

Any restrictions on use

Perspective ATS	Yes	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	No
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Length of sequences

Source ECAC experiments on ASAS

ID 1080

Definition Number of aircraft per sequence

Measure Number of aircraft per sequence

Any restrictions on use

Perspective ATS	Yes	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	No
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

System Performance Metrics

Airport capacity

Source C/AFT Study

ID 1081

Definition Airport capacity per period of time under different runway configurations, weather conditions and procedures

Measure Airport capacity per period of time

Any restrictions on use

Perspective ATS	Yes	**RTS**	No	**Airport**	Yes
Perspective Operator	No	**FTS**	Yes	**TMA**	No
Perspective ASAS	No	**Analytic**	Yes	**En route**	No
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Restrictions

Source C/AFT Study

ID 1083

Definition Number of procedural restrictions

Measure Number of procedural restrictions

Any restrictions on use

Perspective ATS	Yes	**RTS**	No	**Airport**	Yes
Perspective Operator	Yes	**FTS**	No	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	No	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Restrictions (flights)

Source C/AFT Study

ID 1084

Definition Number of flights subject to procedural restrictions

Measure Number of flights subject to procedural restrictions

Any restrictions on use

Perspective ATS	Yes	**RTS**	Yes	**Airport**	Yes
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

System Performance Metrics

Restrictions (amount not constrained)

Source C/AFT Study

Definition Amount of aviation activity not constrained by procedural restrictions

Any restrictions on use

ID 1085

Measure Amount of aviation activity not constrained by procedural restrictions

Perspective ATS	No	**RTS**	Yes	**Airport**	Yes
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Restrictions (impact)

Source C/AFT Study

Definition Severity of impact of the procedural restrictions

Any restrictions on use

ID 1086

Measure
1. Delay due to procedural restrictions
2. Route extension due to procedural restrictions
3. Additional fuel used due to procedural restrictions

Perspective ATS	No	**RTS**	Yes	**Airport**	Yes
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Number of ATC preferred routes

Source C/AFT Study

Definition Number of ATC preferred routes

Any restrictions on use

ID 1087

Measure Number of ATC preferred routes

Perspective ATS	Yes	**RTS**	No	**Airport**	No
Perspective Operator	Yes	**FTS**	No	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	No	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

System Performance Metrics

Number of flights subject to ATC preferred rout

Source C/AFT Study

Definition Percentage of number of flights subject to ATC preferred route

Measure Percentage of number of flights subject to ATC preferred route

Any restrictions on use

ID 1088

Perspective ATS	Yes	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	No
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Aviation activity not on ATC preferred route

Source C/AFT Study

Definition Amount of aviation activity not on ATC preferred route, among flights subject to ATC preferred routes

Measure Amount of aviation activity not on ATC preferred route, among flights subject to ATC preferred routes

Any restrictions on use

ID 1089

Perspective ATS	Yes	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	No
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Deviation between ATC preferred route and flig

Source C/AFT Study

Definition Lateral deviation between ATC preferred route and flight plan route, among flights subject to ATC preferred routes

Measure Lateral deviation between ATC preferred route and flight plan route, among flights subject to ATC preferred routes

Any restrictions on use

ID 1090

Perspective ATS	No	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	No
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

System Performance Metrics

Distance between preferred routes and final rou

Source C/AFT Study

Definition Distance between preferred routes and great circle distance by origin-destination pair, weighed by level of traffic

Measure Distance between preferred routes and great circle distance by origin-destination pair, weighed by level of traffic

Any restrictions on use

ID 1091

Perspective ATS	No	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	No
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Flights able to fly in the requested altitude

Source C/AFT Study

Definition Number of flights whose max. Altitude equalled the requested altitude in flight plan

Measure Number of flights whose max. Altitude equalled the requested altitude in flight plan

Any restrictions on use

ID 1092

Perspective ATS	No	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	No
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Deviation between the requested and flown rou

Source C/AFT Study

Definition Excess descent time over that of an ideal managed descent (From Top of Descent to Wheels Down)

Measure Excess time from top of descent to wheels down

Any restrictions on use

ID 1093

Perspective ATS	No	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

System Performance Metrics

Deviation between the requested and flown rou

Source C/AFT Study

ID 1094

Definition Mean lateral deviation between flight plan route and actual flown route

Measure Mean lateral deviation between flight plan route and actual flown route

Any restrictions on use

Perspective ATS	No	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Pilot controller collaboration

Source C/AFT Study

ID 1095

Definition Number of decisions involving pilot controller collaboration

Measure Number of decisions involving pilot controller collaboration

Any restrictions on use

Perspective ATS	Yes	**RTS**	Yes	**Airport**	Yes
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Freedom to change departure time or planned r

Source PRC Study

ID 1096

Definition Number of regulated flights/ number of actual flights

Measure Number of regulated flights/ number of actual flights

Any restrictions on use

Perspective ATS	Yes	**RTS**	Yes	**Airport**	Yes
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

System Performance Metrics

Freedom to exchange slots (on the ground)

Source PRC Study

ID 1097

Definition Number of slots exchanged/ number of slot exchange requests

Measure Number of slots exchanged/ number of slot exchange requests

Any restrictions on use

Perspective ATS	Yes	**RTS**	Yes	**Airport**	Yes
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

GAT freedom rate

Source Torch Project

ID 1098

Definition Weighted time of unconstrained route usage

Measure Weighted time of unconstrained route usage

Any restrictions on use

Perspective ATS	Yes	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	No
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Freedom to identify re-routes (on the ground)

Source Torch Project

ID 1099

Definition Number of routes offer by CFMU or possible routes

Measure Number of routes offer by CFMU or possible routes

Any restrictions on use

Perspective ATS	Yes	**RTS**	No	**Airport**	No
Perspective Operator	Yes	**FTS**	No	**TMA**	No
Perspective ASAS	Yes	**Analytic**	No	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

System Performance Metrics

Ability of an airspace user to alter speed or alte

Source Torch Project

ID 1100

Definition Number of change request granted in real time/ number of change requests submitted

Any restrictions on use

Measure Number of change request granted in real time/ number of change requests submitted

Perspective ATS	No	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Level of CDM attempted (in the air)

Source Torch Project

ID 1101

Definition Number of interactions between the service provider and the airspace user.

Any restrictions on use

Measure Number of interactions between the service provider and the airspace user.

Perspective ATS	Yes	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Level of CDM achieved (in the air)

Source Torch Project

ID 1102

Definition Frequency with which requests are granted.

Any restrictions on use

Measure Frequency with which requests are granted.

Perspective ATS	Yes	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

System Performance Metrics

Complexity measures activity variance

Source FAA Study

Definition Measure of aircraft clustering within a user specifiable criterion such as 10 miles. The higher the index is the more aircraft are clustering and potentially more likely to conflict

Measure Measure of aircraft clustering within a user specifiable criterion such as 10 miles. The higher the index is the more aircraft are clustering and potentially more likely to conflict

Any restrictions on use

ID 1103

Perspective ATS	Yes	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Altitude- complexity measures

Source FAA Study

Definition Frequency of altitude clearance issued during a run

Measure Frequency of altitude clearance issued during a run

Any restrictions on use

ID 1104

Perspective ATS	Yes	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	No	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	No		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Heading- complexity measures

Source FAA Study

Definition Frequency of heading clearances issued during a run

Measure Frequency of heading clearances issued during a run

Any restrictions on use

ID 1105

Perspective ATS	Yes	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	No	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	No		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

System Performance Metrics

Speed- complexity measures

Source FAA Study

Definition Frequency of speed clearances issued during a run

Measure Frequency of speed clearances issued during a run

Any restrictions on use

ID 1106

Perspective ATS	Yes	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	No	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	No		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Standard instructions

Source ECAC experiments on ASAS

Definition Number of standard instructions, according to the type of instruction (Heading, Direct, Speed, Level)

Measure Number of standard instructions, according to the type of instruction (Heading, Direct, Speed, Level)

Any restrictions on use

ID 1107

Perspective ATS	Yes	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Delegation instructions

Source ECAC experiments on ASAS

Definition Number of delegation instruction (Remain, ResumeThenRemain, Merge, ResumeThenMerge, End of Delegation)

Measure Number of delegation instruction (Remain, ResumeThenRemain, Merge, ResumeThenMerge, End of Delegation)

Any restrictions on use

ID 1108

Perspective ATS	Yes	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

System Performance Metrics

Distance difference

Source ECAC experiments on ASAS

ID 1109

Definition Measure of the difference of flight distance with and without delegation

Any restrictions on use

Measure Measure of the difference of flight distance with and without delegation

Perspective ATS	No	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Traffic density versus FL

Source MAICA project

ID 1110

Definition Number of aircraft per FL

Any restrictions on use

Measure Number of aircraft per FL

Perspective ATS	Yes	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Global traffic density

Source MAICA project

ID 1111

Definition Global number of aircraft

Any restrictions on use

Measure Global number of aircraft

Perspective ATS	Yes	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

System Performance Metrics

Traffic density versus range

Source MAICA project

ID 1112

Definition Number of aircraft contained in some lateral ranges around the aircraft

Measure Number of aircraft contained in some lateral ranges around the aircraft

Any restrictions on use

Perspective ATS	Yes	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Heading distribution

Source MAICA project

ID 1113

Definition The number of headings from the entry point to the exit point of the aircraft sorted by direction (0º-90º, 90º-180º, 180º-270º, 270º-360º)

Measure The number of headings from the entry point to the exit point of the aircraft sorted by direction (0º-90º, 90º-180º, 180º-270º, 270º-360º)

Any restrictions on use

Perspective ATS	Yes	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Initial trajectory length

Source MAICA project

ID 1114

Definition The initial trajectory of an aircraft contains three fixed points: the entry point, a virtual waypoint and the exit point.

Measure Length

Any restrictions on use

Perspective ATS	No	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

System Performance Metrics

Real trajectory length

Source MAICA project

Definition This is the length of the trajectory that was really flown

Any restrictions on use

ID 1115

Measure Length

Perspective ATS	No	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Length increase

Source MAICA project

Definition Ratio: real trajectory length divided by initial trajectory length

Any restrictions on use

ID 1116

Measure Ratio: real trajectory length divided by initial trajectory length

Perspective ATS	No	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Precision approaches

Source C/AFT Study

Definition Number of airports with precision approach capability

Any restrictions on use

ID 1117

Measure Number of airports with precision approach capability

Perspective ATS	Yes	**RTS**	No	**Airport**	Yes
Perspective Operator	Yes	**FTS**	No	**TMA**	No
Perspective ASAS	No	**Analytic**	No	**En route**	No
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

System Performance Metrics

VFR tower services

Source C/AFT Study

Definition Number of operations provided with VFR tower services

Measure Number of operations provided with VFR tower services

Any restrictions on use

ID 1118

Perspective ATS	Yes	**RTS**	No	**Airport**	Yes
Perspective Operator	Yes	**FTS**	Yes	**TMA**	No
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	No
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

CNS coverage

Source C/AFT Study

Definition CNS coverage (various altitudes)

Measure CNS coverage (various altitudes)

Any restrictions on use

ID 1119

Perspective ATS	Yes	**RTS**	Yes	**Airport**	Yes
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

ATM data processing functionality (conflicts)

Source C/AFT Study

Definition Areas with conflict alert and proximity warning

Measure Areas with conflict alert and proximity warning

Any restrictions on use

ID 1120

Perspective ATS	Yes	**RTS**	No	**Airport**	No
Perspective Operator	No	**FTS**	No	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	No	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

System Performance Metrics

ATM data processing functionality (track correl

Source C/AFT Study

Definition Areas with flight plan/ track correlation

Measure Areas with flight plan/ track correlation

Any restrictions on use

ID 1121

Perspective ATS	Yes	**RTS**	No	**Airport**	No
Perspective Operator	No	**FTS**	No	**TMA**	Yes
Perspective ASAS	No	**Analytic**	No	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

ATM data processing functionality (routes, met

Source C/AFT Study

Definition Areas with flight plan/ routes/ airspace/ meteorological data processing

Measure Areas with flight plan/ routes/ airspace/ meteorological data processing

Any restrictions on use

ID 1122

Perspective ATS	Yes	**RTS**	No	**Airport**	No
Perspective Operator	Yes	**FTS**	No	**TMA**	Yes
Perspective ASAS	No	**Analytic**	No	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Availability and quality of VFR in flight services

Source C/AFT Study

Definition Availability and quality of VFR in flight services

Measure Availability and quality of VFR in flight services

Any restrictions on use

ID 1123

Perspective ATS	Yes	**RTS**	No	**Airport**	Yes
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	No	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

System Performance Metrics

Availability and quality of flight services to the

Source C/AFT Study

ID 1124

Definition Availability and quality of flight services to the system user

Any restrictions on use

Measure Availability and quality of flight services to the system user

Perspective ATS	Yes	**RTS**	No	**Airport**	Yes
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Time lost due to any component of the ATM sy

Source PRC Study

ID 1125

Definition Total time affected by any form of industrial action

Any restrictions on use

Measure Total time affected by any form of industrial action

Perspective ATS	Yes	**RTS**	No	**Airport**	Yes
Perspective Operator	Yes	**FTS**	No	**TMA**	Yes
Perspective ASAS	No	**Analytic**	No	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Time lost due to any component of the ATM sy

Source PRC Study

ID 1126

Definition Minutes of unplanned downtime of all critical system

Any restrictions on use

Measure Minutes of unplanned downtime of all critical system

Perspective ATS	Yes	**RTS**	No	**Airport**	Yes
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	No	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

System Performance Metrics

Disruption caused by unavailability

Source PRC Study

ID 1127

Definition Number of flights delayed, re-routed, cancelled or diverted as a result of industrial action / number of planned flights

Any restrictions on use

Measure Number of flights delayed, re-routed, cancelled or diverted as a result of industrial action / number of planned flights

Perspective ATS	Yes	**RTS**	No	**Airport**	Yes
Perspective Operator	Yes	**FTS**	No	**TMA**	Yes
Perspective ASAS	No	**Analytic**	No	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Disruption caused by unavailability (all critical

Source PRC Study

ID 1128

Definition Number of flights delayed, re-routed, cancelled or diverted as a result of downtime of all critical systems/ number of planned flights

Any restrictions on use

Measure Number of flights delayed, re-routed, cancelled or diverted as a result of downtime of all critical systems/ number of planned flights

Perspective ATS	Yes	**RTS**	No	**Airport**	Yes
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Number of hold/turn delays

Source FAA Study

ID 1129

Definition The frequency of hold messages sent to aircraft and the number of turns of greater than 100 seconds duration- non conflict

Any restrictions on use

Measure The frequency of hold messages sent to aircraft and the number of turns of greater than 100 seconds duration- non conflict

Perspective ATS	Yes	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

System Performance Metrics

Communication delay

Source FAA Study

Definition The accumulated time variable based on the duration of time between the aircraft calls for service and the controllers' initial response

Measure The accumulated time variable based on the duration of time between the aircraft calls for service and the controllers' initial response

Any restrictions on use ASAS relationship is through potential for fewer messages and lower workload.

ID 1130

Perspective ATS	Yes	**RTS**	Yes	**Airport**	Yes
Perspective Operator	Yes	**FTS**	No	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	No	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Number of communication delays

Source FAA Study

Definition This is the cumulated frequency of communication delays that exceed 20 seconds

Measure The cumulated frequency of communication delays that exceed 20 seconds

Any restrictions on use ASAS relationship is through potential for fewer messages and lower workload.

ID 1131

Perspective ATS	Yes	**RTS**	Yes	**Airport**	Yes
Perspective Operator	Yes	**FTS**	No	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	No	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Voice frequency- communication activity

Source FAA Study

Definition The number of push-to-talks accumulated during the run

Measure The number of push-to-talks accumulated during the run

Any restrictions on use ASAS relationship is through potential for fewer messages and lower workload.

ID 1132

Perspective ATS	Yes	**RTS**	Yes	**Airport**	Yes
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

System Performance Metrics

Voice duration communication activity

Source FAA Study

Definition The total duration of communications during a run

Measure The total duration of communications during a run

Any restrictions on use ASAS relationship is through potential for fewer messages and lower workload.

ID 1133

Perspective ATS	Yes	**RTS**	Yes	**Airport**	Yes
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Messages exchanged

Source ECAC experiments on ASAS

Definition Number of messages exchanged (include target selections for ASAS equipped aircraft)

Measure Number of messages exchanged (include target selections for ASAS equipped aircraft)

Any restrictions on use

ID 1134

Perspective ATS	Yes	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Frequency occupancy

Source ECAC experiments on ASAS

Definition Amount of time the frequency is engaged

Measure Amount of time the frequency is engaged

Any restrictions on use

ID 1135

Perspective ATS	Yes	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

System Performance Metrics

ATFM equity

Source C/AFT Study

ID 1136

Definition Deviation from standard equity rule (slots)

Measure Deviation from standard equity rule (slots)

Any restrictions on use

Perspective ATS	Yes	**RTS**	Yes	**Airport**	Yes
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

ATFM exempted flights

Source C/AFT Study

ID 1137

Definition Traffic exempted from ATFM regulations (flights)

Measure Traffic exempted from ATFM regulations (flights)

Any restrictions on use

Perspective ATS	Yes	**RTS**	No	**Airport**	No
Perspective Operator	Yes	**FTS**	No	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

ATFM overloads

Source C/AFT Study

ID 1138

Definition Number of flights exceeding the capacity per sector per hours

Measure Number of flights exceeding the capacity per sector per hours

Any restrictions on use

Perspective ATS	Yes	**RTS**	No	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

System Performance Metrics

ATFM underdeliveries

Source C/AFT Study

Definition Number of lost slots per regulation per hour

Measure Number of lost slots per regulation per hour

Any restrictions on use

ID 1139

Perspective ATS	Yes	**RTS**	No	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Flights not adhering to ATFM slots

Source C/AFT Study

Definition Regulated flights departing outside slot window

Measure Regulated flights departing outside slot window

Any restrictions on use

ID 1140

Perspective ATS	Yes	**RTS**	Yes	**Airport**	Yes
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Flights with delay compensation

Source C/AFT Study

Definition Departure time earlier to compensate for delay

Measure Departure time earlier to compensate for delay

Any restrictions on use

ID 1141

Perspective ATS	Yes	**RTS**	No	**Airport**	Yes
Perspective Operator	Yes	**FTS**	No	**TMA**	Yes
Perspective ASAS	No	**Analytic**	No	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

System Performance Metrics

Ghost flights

Source C/AFT Study

Definition Flight plans not cancelled and non-activated

Any restrictions on use

ID 1142

Measure Flight plans not cancelled and non-activated

Perspective ATS	Yes	**RTS**	No	**Airport**	Yes
Perspective Operator	Yes	**FTS**	No	**TMA**	Yes
Perspective ASAS	No	**Analytic**	No	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Multiple flights

Source C/AFT Study

Definition Cancelled flight plans with similar parameters

Any restrictions on use

ID 1143

Measure Number of cancelled flight plans per period

Perspective ATS	Yes	**RTS**	No	**Airport**	Yes
Perspective Operator	Yes	**FTS**	No	**TMA**	Yes
Perspective ASAS	No	**Analytic**	No	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Equity of treatment of all airspace users within

Source PRC Study

Definition % of aircraft operators by class who consider that equity is being achieved (collected by customer service questionnaires)

Any restrictions on use

ID 1144

Measure % of aircraft operators by class who consider that equity is being achieved (collected by customer service questionnaires)

Perspective ATS	Yes	**RTS**	No	**Airport**	Yes
Perspective Operator	Yes	**FTS**	No	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	No	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

System Performance Metrics

Equity of the planning functions

Source Torch Project

Definition % of user equity achieved

Any restrictions on use

ID 1145

Measure % of user equity achieved

Perspective ATS	Yes	**RTS**	Yes	**Airport**	Yes
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Equity of the planning functions (expenditure)

Source Torch Project

Definition Degree of airspace involvement with ATM providers in ensuring that expenditure is made in areas which will benefit the users

Any restrictions on use

ID 1146

Measure Degree of airspace involvement with ATM providers in ensuring that expenditure is made in areas which will benefit the users

Perspective ATS	Yes	**RTS**	No	**Airport**	Yes
Perspective Operator	Yes	**FTS**	No	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	No	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Average time in sector- Capacity

Source FAA Study

Definition Average time an aircraft spent under a controller's control

Any restrictions on use

ID 1147

Measure Average time an aircraft spent under a controller's control

Perspective ATS	Yes	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	No	**En route**	Yes
Perspective Human Perfomance	Yes	**Survey**	No		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

System Performance Metrics

Taskload per aircraft- Capacity

Source FAA Study

Definition Number of task operations performed per aircraft

Measure Number of task operations performed per aircraft

Any restrictions on use

ID 1148

Perspective ATS	Yes	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	No	**En route**	Yes
Perspective Human Perfomance	Yes	**Survey**	No		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Amount of in-track time spent inside the final a

Source FAA Study

Definition The amount of controller monitoring inside the final approach fix

Measure The amount of controller monitoring inside the final approach fix

Any restrictions on use

ID 1149

Perspective ATS	Yes	**RTS**	Yes	**Airport**	Yes
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	No	**En route**	No
Perspective Human Perfomance	Yes	**Survey**	No		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Number of required procedures

Source FAA Study

Definition This is the number of procedures used to move an aircraft through a sector airspace

Measure This is the number of procedures used to move an aircraft through a sector airspace

Any restrictions on use

ID 1150

Perspective ATS	Yes	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	No	**En route**	Yes
Perspective Human Perfomance	Yes	**Survey**	No		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

System Performance Metrics

Average workload

Source FAA Study

Definition This is an average of an overall rating of workload given at the end of the experimental run

Measure This is an average of an overall rating of workload given at the end of the experimental run

Any restrictions on use

ID 1151

Perspective ATS	Yes	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	No	**En route**	Yes
Perspective Human Perfomance	Yes	**Survey**	No		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Between sector coordination

Source FAA Study

Definition Measure of the taskload generated by coordination with controllers in adjacent sectors

Measure Measure of the taskload generated by coordination with controllers in adjacent sectors

Any restrictions on use

ID 1152

Perspective ATS	Yes	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	No	**En route**	Yes
Perspective Human Perfomance	Yes	**Survey**	No		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Within sector coordination (R&D teamwork)

Source FAA Study

Definition Measure of the taskload generated by the coordination between radar and data controllers

Measure Measure of the taskload generated by the coordination between radar and data controllers

Any restrictions on use

ID 1153

Perspective ATS	Yes	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	No	**En route**	Yes
Perspective Human Perfomance	Yes	**Survey**	No		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

System Performance Metrics

Handoffs

Source FAA Study

Definition The number of handoffs that occurred during an experimental run

Measure The number of handoffs that occurred during an experimental run

Any restrictions on use

ID 1154

Perspective ATS	Yes	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	No	**En route**	Yes
Perspective Human Perfomance	Yes	**Survey**	No		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Handoff misses- non conflict errors

Source FAA Study

Definition Frequency in which the aircraft crossed the sector boundary before being handed off

Measure Frequency in which the aircraft crossed the sector boundary before being handed off

Any restrictions on use

ID 1155

Perspective ATS	Yes	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	No	**En route**	Yes
Perspective Human Perfomance	Yes	**Survey**	No		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Handoff errors- non conflict errors

Source FAA Study

Definition Frequency with which the aircraft was handed to the wrong controller

Measure Frequency with which the aircraft was handed to the wrong controller

Any restrictions on use

ID 1156

Perspective ATS	Yes	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	No	**En route**	Yes
Perspective Human Perfomance	Yes	**Survey**	No		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

System Performance Metrics

Communications rating formats

Source

Definition Procedures for rating effectiveness of communications procedures (e.g. conduct of briefings, inquiry/advocacy/ assertion, conflict resolution, etc.)

Measure Procedures for rating effectiveness of communications procedures (e.g. conduct of briefings, inquiry/advocacy/ assertion, conflict resolution, etc.)

Any restrictions on use

ID 1158

Perspective ATS	No	**RTS**	No	**Airport**	No
Perspective Operator	No	**FTS**	No	**TMA**	No
Perspective ASAS	No	**Analytic**	No	**En route**	No
Perspective Human Perfomance	Yes	**Survey**	No		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Measurements of shared mental models

Source

Definition Measures of the extent to which team members hold a common shared model of the situation, tasks, fellow team members and their capabilities, etc

Measure Measures of the extent to which team members hold a common shared model of the situation, tasks, fellow team members and their capabilities, etc

Any restrictions on use

ID 1159

Perspective ATS	No	**RTS**	No	**Airport**	No
Perspective Operator	No	**FTS**	No	**TMA**	No
Perspective ASAS	No	**Analytic**	No	**En route**	No
Perspective Human Perfomance	Yes	**Survey**	No		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Timeline analysis

Source

Definition Recording of team actions and communications on a time-line, providing a detailed description of team member interactions, responses to environmental events and sources of errors.

Measure Recording of team actions and communications on a time-line, providing a detailed description of team member interactions, responses to environmental events and sources of errors.

Any restrictions on use

ID 1160

Perspective ATS	No	**RTS**	No	**Airport**	No
Perspective Operator	No	**FTS**	No	**TMA**	No
Perspective ASAS	No	**Analytic**	No	**En route**	No
Perspective Human Perfomance	Yes	**Survey**	No		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

System Performance Metrics

Team co-ordination observation

Source

Definition Checklist based procedure based on a list of team processes and typical behaviours associated with each. These are ticked off when observed.

Any restrictions on use

ID 1161

Measure Checklist based procedure based on a list of team processes and typical behaviours associated with each. These are ticked off when observed.

Perspective ATS	No	**RTS**	No	**Airport**	No
Perspective Operator	No	**FTS**	No	**TMA**	No
Perspective ASAS	No	**Analytic**	No	**En route**	No
Perspective Human Perfomance	Yes	**Survey**	No		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Behavioural observation scales

Source

Definition Procedure used to rate the occurrence of teamwork of various kinds by a particular team and its members. A separate scale may be provided for each team process to be rated. The rating scale is normally supported by a definition of each team process

Any restrictions on use

ID 1162

Measure Procedure used to rate the occurrence of teamwork of various kinds by a particular team and its members. A separate scale may be provided for each team process to be rated. The rating scale is normally supported by a definition of each team process

Perspective ATS	No	**RTS**	No	**Airport**	No
Perspective Operator	No	**FTS**	No	**TMA**	No
Perspective ASAS	No	**Analytic**	No	**En route**	No
Perspective Human Perfomance	Yes	**Survey**	No		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Event-based performance measurement

Source

Definition Procedure that requires pre-specification of desirable team behaviours to be observed. Normally requires use of pre-specified exercise scenarios and events.

Any restrictions on use

ID 1163

Measure Procedure that requires pre-specification of desirable team behaviours to be observed. Normally requires use of pre-specified exercise scenarios and events.

Perspective ATS	No	**RTS**	No	**Airport**	No
Perspective Operator	No	**FTS**	No	**TMA**	No
Perspective ASAS	No	**Analytic**	No	**En route**	No
Perspective Human Perfomance	Yes	**Survey**	No		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

System Performance Metrics

Observation based questionnaire

Source

Definition Procedure typically requires observers to rate the performance of a team on a questionnaire-based set of effectiveness and efficiency criteria. The criteria may be organised under various headings that may include team

Any restrictions on use

ID 1164

Measure Procedure typically requires observers to rate the performance of a team on a questionnaire-based set of effectiveness and efficiency criteria. The criteria may be organised under various headings that may include team processes

Perspective ATS	No	**RTS**	No	**Airport**	No
Perspective Operator	No	**FTS**	No	**TMA**	No
Perspective ASAS	No	**Analytic**	No	**En route**	No
Perspective Human Perfomance	Yes	**Survey**	No		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Team self-assessment questionnaire

Source

Definition Team members themselves observe each other and rate their own efficiency and effectiveness on various criteria in the form of a set of questions.

Any restrictions on use

ID 1165

Measure Team members themselves observe each other and rate their own efficiency and effectiveness on various criteria in the form of a set of questions.

Perspective ATS	No	**RTS**	No	**Airport**	No
Perspective Operator	No	**FTS**	No	**TMA**	No
Perspective ASAS	No	**Analytic**	No	**En route**	No
Perspective Human Perfomance	Yes	**Survey**	No		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Team Process Quality rating form

Source

Definition (Part of a set) Provides information on how well a team communicates and interacts whilst carrying out observed ATM activities.

Any restrictions on use

ID 1166

Measure Information on how well a team communicates and interacts whilst carrying out observed ATM activities.

Perspective ATS	No	**RTS**	No	**Airport**	No
Perspective Operator	No	**FTS**	No	**TMA**	No
Perspective ASAS	No	**Analytic**	No	**En route**	No
Perspective Human Perfomance	Yes	**Survey**	No		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

System Performance Metrics

Team Process Frequency recording form

Source

Definition (Part of a set) Provides a quantitative measure of teamwork, in the form of a log of the observed frequency of occurrence of team-working behaviours.

Any restrictions on use

ID 1167

Measure Quantitative measure of teamwork, in the form of a log of the observed frequency of occurrence of team-working behaviours.

Perspective ATS	No	**RTS**	No	**Airport**	No
Perspective Operator	No	**FTS**	No	**TMA**	No
Perspective ASAS	No	**Analytic**	No	**En route**	No
Perspective Human Perfomance	Yes	**Survey**	No		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Team Process Questionnaire

Source

Definition (Part of a set) Designed to collect the views of trial participants on the effect of system automation on team processes.

Any restrictions on use

ID 1168

Measure Views of trial participants on the effect of system automation on team processes.

Perspective ATS	No	**RTS**	No	**Airport**	No
Perspective Operator	No	**FTS**	No	**TMA**	No
Perspective ASAS	No	**Analytic**	No	**En route**	No
Perspective Human Perfomance	Yes	**Survey**	No		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Heart Rate

Source

Definition Temporal resolution poorer (roughly 3 minutes) than for some other physiological measures; High expertise required to measure and analyse

Any restrictions on use

ID 1169

Measure Heart rate

Perspective ATS	No	**RTS**	No	**Airport**	No
Perspective Operator	No	**FTS**	No	**TMA**	No
Perspective ASAS	No	**Analytic**	No	**En route**	No
Perspective Human Perfomance	Yes	**Survey**	No		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

System Performance Metrics

Heart Rate Variability

Source

Definition Procedures for rating effectiveness of communications procedures (e.g. conduct of briefings, inquiry/advocacy/ assertion, conflict resolution, etc.)

Any restrictions on use

ID 1170

Measure Heart Rate Variability

Perspective ATS	No	**RTS**	No	**Airport**	No
Perspective Operator	No	**FTS**	No	**TMA**	No
Perspective ASAS	No	**Analytic**	No	**En route**	No
Perspective Human Perfomance	Yes	**Survey**	No		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Blink rate

Source

Definition Blink rate

Any restrictions on use

ID 1171

Measure Blink rate

Perspective ATS	No	**RTS**	No	**Airport**	No
Perspective Operator	No	**FTS**	No	**TMA**	No
Perspective ASAS	No	**Analytic**	No	**En route**	No
Perspective Human Perfomance	Yes	**Survey**	No		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Pupil diameter

Source

Definition Good temporal resolution, but also costly in terms of expertise. Equipment for eye tracking expensive and generally not portable; Ocular measures currently quite intrusive. Subject to light (eg probably not suitable for use

Any restrictions on use

ID 1172

Measure Pupil diameter

Perspective ATS	No	**RTS**	No	**Airport**	No
Perspective Operator	No	**FTS**	No	**TMA**	No
Perspective ASAS	No	**Analytic**	No	**En route**	No
Perspective Human Perfomance	Yes	**Survey**	No		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

System Performance Metrics

Other ocular measures

Source

Definition Include fixation frequency, average dwell time, scanning entropy (i.e. randomness), and blink-saccade decoupling. Are derived from same eye tracking record as above metrics. With same disadvantages (required expertise)

Any restrictions on use

ID 1173

Measure Fixation frequency, average dwell time, scanning entropy (i.e. randomness), and blink-saccade decoupling.

Perspective ATS	No	**RTS**	No	**Airport**	No
Perspective Operator	No	**FTS**	No	**TMA**	No
Perspective ASAS	No	**Analytic**	No	**En route**	No
Perspective Human Perfomance	Yes	**Survey**	No		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Galvanic skin response (skin resistance)

Source

Definition Expensive equipment and expertise required

Any restrictions on use

ID 1174

Measure Galvanic skin response

Perspective ATS	No	**RTS**	No	**Airport**	No
Perspective Operator	No	**FTS**	No	**TMA**	No
Perspective ASAS	No	**Analytic**	No	**En route**	No
Perspective Human Perfomance	Yes	**Survey**	No		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Evoked brain potentials

Source

Definition Good for assessing workload in situations involving no physical response. Expensive and demanding in terms of expertise.

Any restrictions on use

ID 1175

Measure Evoked brain potentials

Perspective ATS	No	**RTS**	No	**Airport**	No
Perspective Operator	No	**FTS**	No	**TMA**	No
Perspective ASAS	No	**Analytic**	No	**En route**	No
Perspective Human Perfomance	Yes	**Survey**	No		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

System Performance Metrics

NASA TLX ratings

Source

Definition One of the better-known subjective survey techniques.

Any restrictions on use

ID 1176

Measure NASA TLX ratings

Perspective ATS	No	**RTS**	No	**Airport**	No
Perspective Operator	No	**FTS**	No	**TMA**	No
Perspective ASAS	No	**Analytic**	No	**En route**	No
Perspective Human Perfomance	Yes	**Survey**	No		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

ISA ratings

Source

Definition Simple subjective technique, well integrated with EEC's simulation platform.

Any restrictions on use

ID 1177

Measure ISA ratings

Perspective ATS	No	**RTS**	No	**Airport**	No
Perspective Operator	No	**FTS**	No	**TMA**	No
Perspective ASAS	No	**Analytic**	No	**En route**	No
Perspective Human Perfomance	Yes	**Survey**	No		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Bedford Workload Scale

Source

Definition A subjective technique for pilots. Well –accepted by flightcrews, but some practice might be necessary with the scale (Roscoe, 1984; Gawron, 2000).

Any restrictions on use

ID 1178

Measure Bedford Workload Scale

Perspective ATS	No	**RTS**	No	**Airport**	No
Perspective Operator	No	**FTS**	No	**TMA**	No
Perspective ASAS	No	**Analytic**	No	**En route**	No
Perspective Human Perfomance	Yes	**Survey**	No		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

System Performance Metrics

Cooper Harper Rating Scale

Source

Definition Decision tree method, used for assessing aircraft handling qualities. Only appropriate if aircraft handling difficulty is major determinant of workload.

Any restrictions on use

ID 1179

Measure Cooper Harper Rating Scale

Perspective ATS	No	**RTS**	No	**Airport**	No
Perspective Operator	No	**FTS**	No	**TMA**	No
Perspective ASAS	No	**Analytic**	No	**En route**	No
Perspective Human Perfomance	Yes	**Survey**	No		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Subjective Workload Assessment Technique S

Source

Definition Like TLX, is multidimensional (though only three dimensions (time, mental effort, psychological stress). More intrusive than ISA. Well researched and generally well regarded. Applied in many settings. Card sorting

Any restrictions on use

ID 1180

Measure Subjective Workload Assessment Technique

Perspective ATS	No	**RTS**	No	**Airport**	No
Perspective Operator	No	**FTS**	No	**TMA**	No
Perspective ASAS	No	**Analytic**	No	**En route**	No
Perspective Human Perfomance	Yes	**Survey**	No		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

PUMA

Source

Definition Analytic technique to assess scenario taskload, based on task types, timing and interactions

Any restrictions on use

ID 1181

Measure PUMA

Perspective ATS	No	**RTS**	No	**Airport**	No
Perspective Operator	No	**FTS**	No	**TMA**	No
Perspective ASAS	No	**Analytic**	No	**En route**	No
Perspective Human Perfomance	Yes	**Survey**	No		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

System Performance Metrics

Embedded tasks

Source

Definition Natural but secondary component of an operator's entire task set; Embedded task performance (e.g. responding to ATC calls) is used as indirect indication of demands of a primary task (e.g. tracking a flightpath)

Any restrictions on use

ID 1182

Measure Natural but secondary component of an operator's entire task set; Embedded task performance (e.g. responding to ATC calls) is used as indirect indication of demands of a primary task (e.g. tracking a flightpath).

Perspective ATS	No	**RTS**	No	**Airport**	No
Perspective Operator	No	**FTS**	No	**TMA**	No
Perspective ASAS	No	**Analytic**	No	**En route**	No
Perspective Human Perfomance	Yes	**Survey**	No		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Number of refused military access requests

Source CARE ASAS Act2

Definition Number of refused requests for military traffic transiting civil airspace.

Any restrictions on use

ID 1183

Measure Number of refused requests for military traffic transiting civil airspace per period

Perspective ATS	Yes	**RTS**	No	**Airport**	No
Perspective Operator	Yes	**FTS**	No	**TMA**	Yes
Perspective ASAS	No	**Analytic**	No	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

ATS productivity

Source Torch Project

Definition The productivity of the ATS provided to users

Any restrictions on use

ID 1184

Measure 1. Flight hours / controller
2. Capacity used / capacity offered
(capacity offered is smaller of)

Perspective ATS	Yes	**RTS**	Yes	**Airport**	No
Perspective Operator	Yes	**FTS**	No	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	No	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

System Performance Metrics

Unit costs of en-route service

Source Torch Project

Definition Unit costs of en-route service

Any restrictions on use

ID 1185

Measure
1. Cost per flight
2. Cost per km flown
3. Cost per km flown per state

Perspective ATS	No	**RTS**	No	**Airport**	No
Perspective Operator	Yes	**FTS**	No	**TMA**	No
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Delay costs to passengers

Source Torch Project

Definition Costs incurred by passengers as a consequence of delays

Any restrictions on use

ID 1186

Measure € per passenger carried

Perspective ATS	No	**RTS**	No	**Airport**	Yes
Perspective Operator	Yes	**FTS**	No	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Delay costs to airlines

Source Torch Project

Definition Costs incurred by passengers as a consequence of delays

Any restrictions on use

ID 1187

Measure
1. € per passenger carried
2. € per aircraft movement

Perspective ATS	No	**RTS**	No	**Airport**	Yes
Perspective Operator	Yes	**FTS**	No	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

System Performance Metrics

User operation costs

Source Torch Project

Definition Operating cost for a given aircraft type over a given route

Any restrictions on use

ID 1188

Measure
1. Cost per NM
2. Cost per flight

Perspective ATS	No	**RTS**	No	**Airport**	Yes
Perspective Operator	Yes	**FTS**	No	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Time taken to identify an abnormal deviation fr

Source CARE ASAS Act2

Definition The time taken to recognise a deviation from expected behaviour is dangerous or indicative of malicious interference.

Any restrictions on use Applicability is highly airspace dependant.

ID 1189

Measure Number of seconds from start of deviation to alerting mechanism being initiated.

Perspective ATS	Yes	**RTS**	Yes	**Airport**	Yes
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	No	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	No		
Objectivity	Objective	**Validity**			
Intrusive		**Utility**			
Cost of equipment	High	**Expertise required**	High		
Reliability	Low	**Resource intensity**	High		

Time taken to identify a false ADS-B type target

Source CARE ASAS Act2

Definition Time taken to identify that an ADS-B target forming part of a larger overall air picture is false - i.e. false position reports are being received

Any restrictions on use

ID 1190

Measure Number of seconds from the acquistion of the target until the recognition that the target is false.

Perspective ATS	Yes	**RTS**	Yes	**Airport**	Yes
Perspective Operator	Yes	**FTS**	No	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

System Performance Metrics

Time taken to notify a false ADS-B type target

Source CARE ASAS Act2

ID 1191

Definition Time taken to nullify the danger/disruption caused by a false ADS-B target.

Measure Number of seconds from the acquistion of the target until the action to nullify or minimise the risks has been completed.

Any restrictions on use

Perspective ATS	Yes	**RTS**	Yes	**Airport**	Yes
Perspective Operator	Yes	**FTS**	No	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	Yes		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**			
Reliability		**Resource intensity**			

Information processing load

Source INTEGRA

ID 1193

Definition Information processed per unit time applied to each processing component or 'actor' in a system. The actor may be a human or automated component.

Measure Continuous sampling of information processed per unit time

Any restrictions on use Requires calibration to provide a maximum processing load for each actor in order to derive a capacity estimate.

Perspective ATS	Yes	**RTS**	Yes	**Airport**	Yes
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	No		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**	High		
Reliability		**Resource intensity**			

Propensity

Source INTEGRA

ID 1194

Definition The likelihood of a safety significant event occurring during normal operations

Measure The likelihood of a safety significant event occurring during normal operations

Any restrictions on use

Perspective ATS	Yes	**RTS**	Yes	**Airport**	Yes
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	No		
Objectivity		**Validity**			
Intrusive		**Utility**			
Cost of equipment		**Expertise required**	High		
Reliability		**Resource intensity**			

System Performance Metrics

Resilience

Source INTEGRA

ID 1195

Definition	The extent to which the ATM system responds to a safety significant event without causing more such events.
Measure	The extent to which the ATM system responds to a safety significant event without causing more such events.
Any restrictions on use	

Perspective ATS	Yes	**RTS**	Yes	**Airport**	Yes
Perspective Operator	Yes	**FTS**	Yes	**TMA**	Yes
Perspective ASAS	Yes	**Analytic**	Yes	**En route**	Yes
Perspective Human Perfomance	No	**Survey**	No		

Objectivity		**Validity**	
Intrusive		**Utility**	
Cost of equipment		**Expertise required**	High
Reliability		**Resource intensity**	