Achieving Quality of Canadian Crash Data

September, 2009

nada's Road Safety Vision

of the strategic goals is:

o improve National Road Safety Data Quality and Collection »

ly, there would be performance measures attached to this
ment in the follow-up Vision.

sh Database History

sdictions had their own crash form

ouped together into the TRAID (Traffic Accident information base) in 1984

DB (National Collision Database) 1994 (implemented 2000)

DB v.2 accepted in 2007, (implemented in two jurisdictions)

Properties of Data Quality

evance: Why do we collect it? Does it meet our needs?

mpleteness: Missing fields? Incomplete records?

neliness: Are deadlines met? Is the data current?

uracy: Does the data reflect the reality?

mparability: How does it compare to external sources?

herence: Self-audit?

formity: Are all jurisdictions using the same definitions?

y does data quality matter?

putation …

ers need accurate answers

- Achieving vision targets and sub-targets

ne data sufficiently accurate to built models

- to evaluate a new vehicle technology?
- to impute BAC levels for those fatalities that were not teste coroners?
- Etc…

evance

cument who and for what purpose is each data element needed

- Need to convince those who collect the data of its importan

e the people collecting the data competent at assessing the vari
s for the variables ?

n this variable be obtained through data linking with another
base?

levance of data needs to be at the forefront of the
ussion

formity

ke a list of all the definitions and ensure uniformity

- Definition of a traffic fatality, public road, urban/rural, etc.

mparable to USA and/or OECD

rently the definition of a traffic fatality is “the sum of whateve
Canadian jurisdiction uses as a definition of a traffic fatality”.

iformity of data is necessary for comparison between jurisdicti
n Canada

uracy

king crash data with the data from our in-depth collision stigations and comparing all data elements in common.

king crash data with data collected from Event Data Recorders R)

king crash data with coroner data

king crash data with hospital trauma data

erence

all vehicles have a driver (unless they are parked)?

t-checks…

nparability

mparing our data to other sources :

- Statistics Canada records of deaths
- CIHI tabulations of traffic injuries
- Comparison with literature from other countries

us of Work

evance: contract to document the latest edition of the data onary

formity: Definition of a traffic fatality was reviewed

neliness: assessed annually

mpleteness: evaluated using 2006 data, could be done annually

curacy: evaluated using CI for years 2001-2005 data, will be ne in 5 years

herence underway

mparability: comparing NCDB with data tabulated by Canadia ute for Health Information.

Uniformity

Definition of a Traffic Fatality

inition from OECD

on killed: Any person killed immediately or dying within 30 days as a r
injury accident;

IRTAD note: For countries that do not apply this definition, conversion coefficie
imated so that comparisons on the basis of the 30 day-definition can be made.

y Accident: Any accident involving at least one road vehicle in motion
c road or private road to which the public has access, resulting in at leas
d or killed person (road vehicle is defined below).

Vehicle: A vehicle running on wheels and intended for use on roads.

w Canadian Definition of a traffic fatality

y: Any person killed immediately or *dying within 30 days* as a result of an *unintentional* inju
d in a crash involving *at least one motor vehicle*, *in motion*, *on a public road* as defined in
t legislation in each jurisdiction*.*

ions:

Suicide and homicides committed using a motor vehicle, assuming that suicide/homicide ha
etermined as the cause.

A driver of a motor vehicle who dies from a medical condition (e.g. cerebral hemorrhage, he
or diabetic coma) prior to involvement of the vehicle in a collision. The death, due to the m
on, must be clearly established.

ons:

Unintentional victims in any crashes. (e.g. a pedestrian that may have been hit by a vehicle
cide/homicide was being attempted or a third party vehicle struck in a police pursuit, etc)

Fatalities where a medical condition has contributed to the crash.

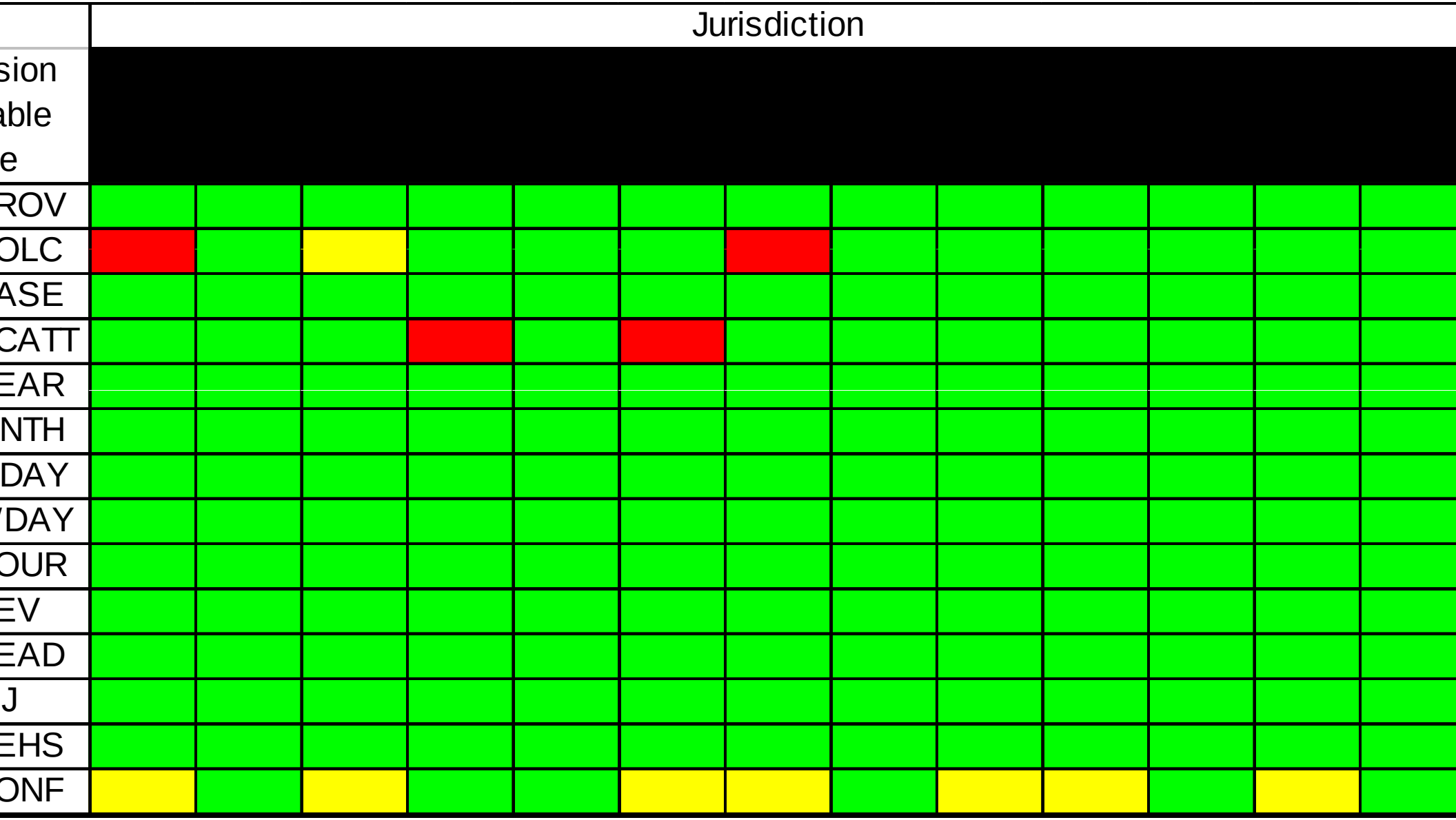
All motorized vehicles, including ATVs and snowmobiles, involved in single vehicle crashes
ng on a public road.

Fatalities resulting from unsecured cargo or object that has fallen off another vehicle.

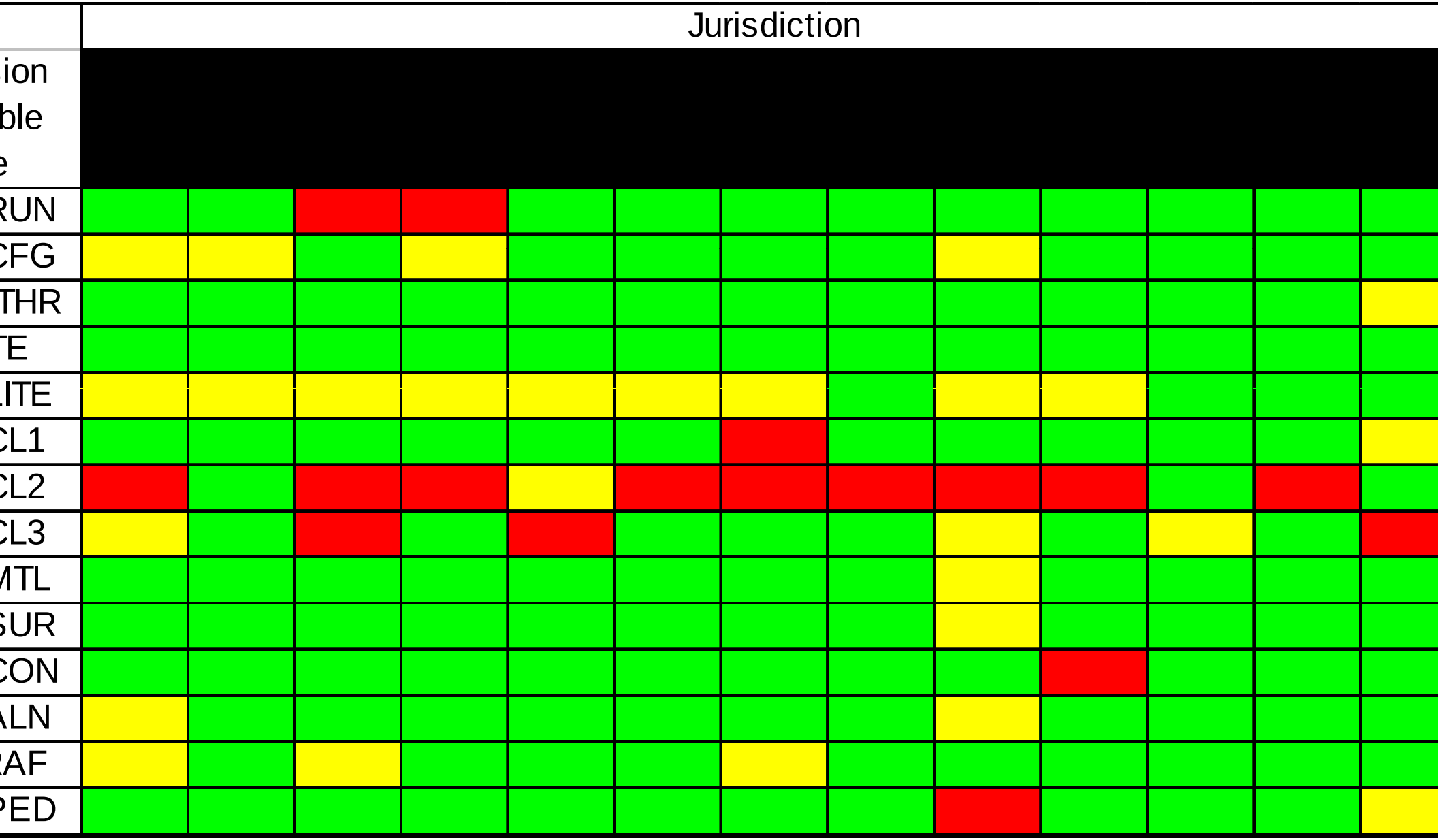
Completeness

ly” Available Scores for Fatal and Serious Injury Collision

ision data elements « true » availability



ision data elements « true » availability (continue



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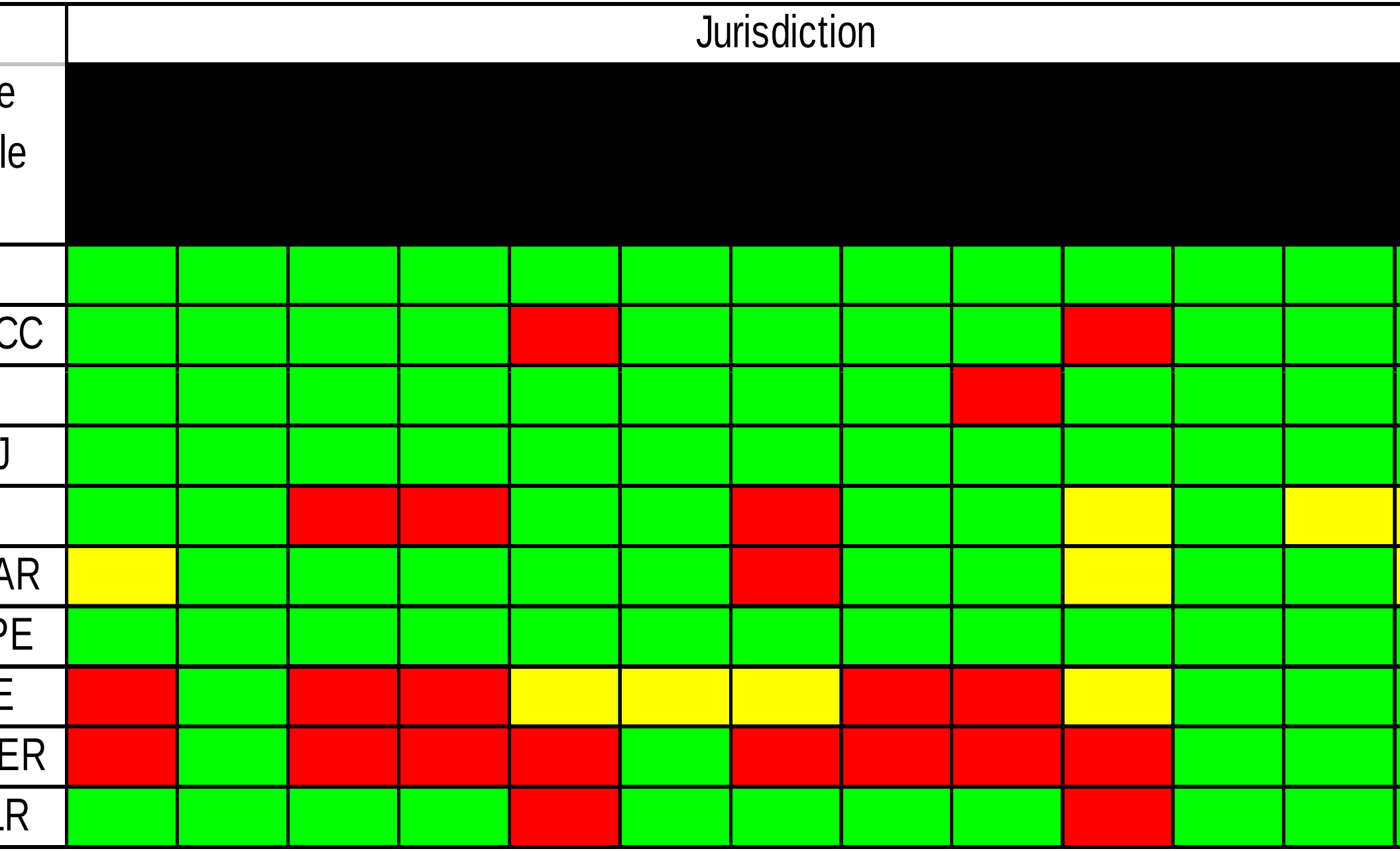
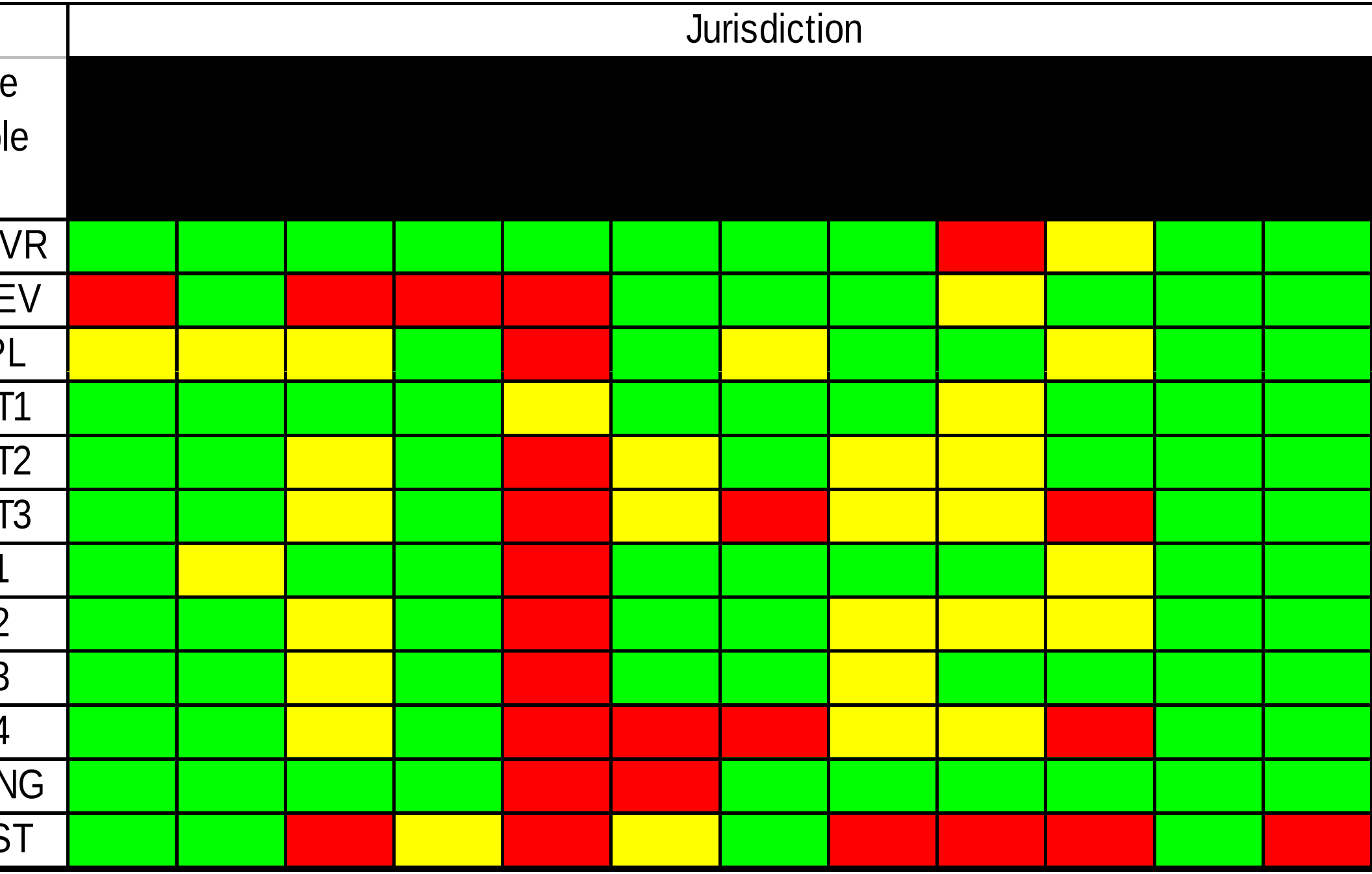
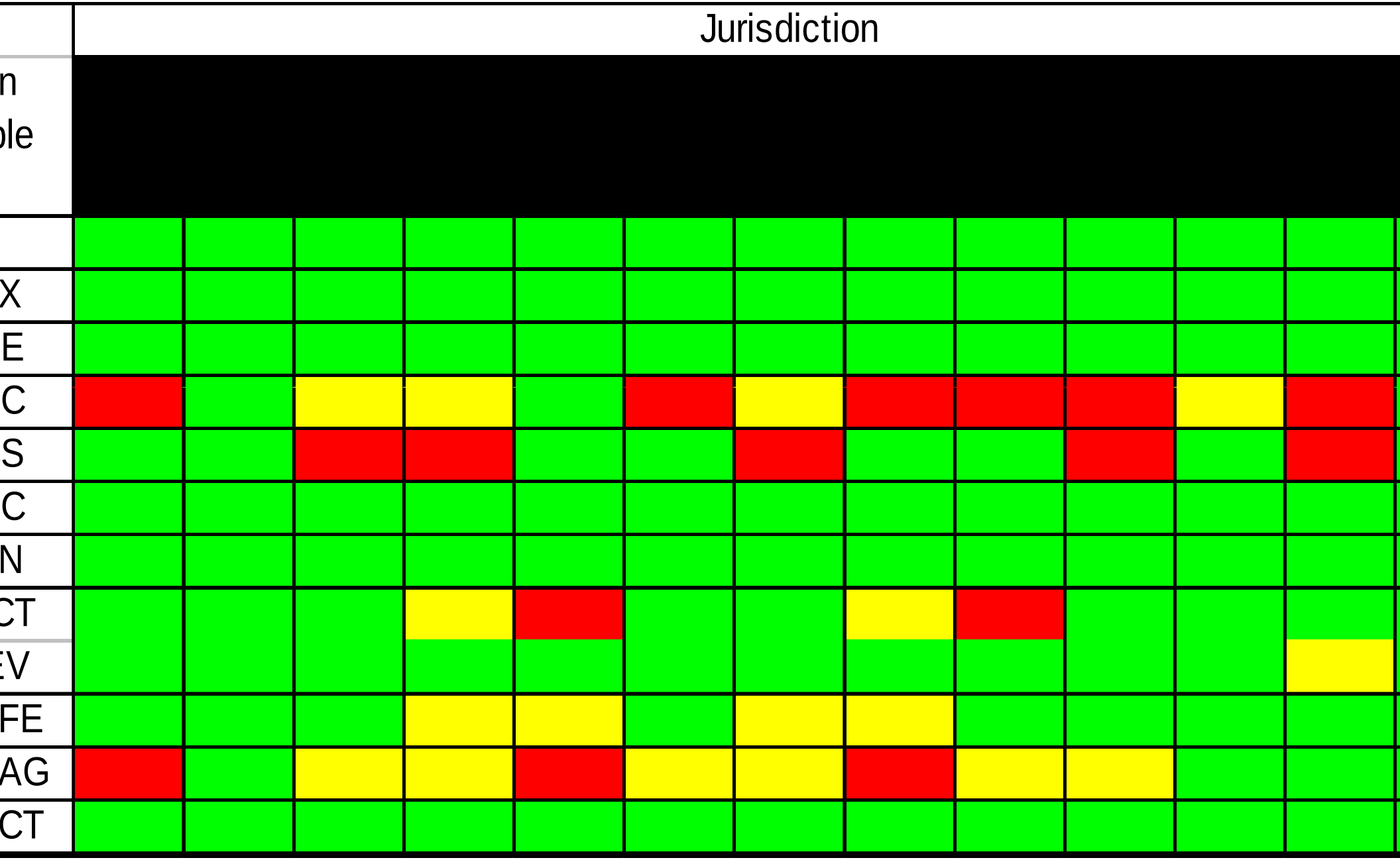


icle data elements « true » availability (continued)



son data elements « true » availability (continued)



y" Available Scores for Fatal and Serious Injury Collisions

urisdiction	Collision Level	Vehicle Level	Person Level	All Levels
	71%	77%	83%	76%
	93%	91%	100%	94%
	75%	50%	75%	66%
	82%	77%	58%	76%
	89%	32%	75%	66%
	86%	73%	83%	81%
	79%	68%	67%	73%
	96%	64%	67%	79%
	68%	50%	75%	63%
	86%	45%	67%	68%
	96%	100%	92%	97%
	93%	91%	75%	89%
	86%	91%	100%	90%

eliness of 2005 & 2006 Data

sdiction	2005 Date Received	2005 Days from Deadline	2006 Date Received	2006 Days Dea
	01-Feb-07	154	25-Sep-07	
	06-Sep-06	6	26-Jun-07	
	24-Jul-06	-38	28-Sep-07	
	22-Jun-06	-70	28-May-07	
	24-May-06	-99	22-May-07	
	15-Feb-07	168	14-Mar-08	
	05-Jan-07	127	11-May-07	
	25-Jul-06	-37	30-Aug-07	
	28-Aug-06	-3	31-Aug-07	
	16-Oct-06	46	22-Jan-08	
	24-Aug-06	-7	30-Jul-07	
	02-Jan-07	124	24-Aug-07	
	24-Aug-06	-7	18-Sep-07	

Accuracy

nparison of NCDB with the collisions investigation (CI)

nber of collisions in the CI database by year and sdiction

ction	2001	2002	2003	2004	2005	Total
[redacted]	33	27	34	27	10	131
	43	36	40	36	13	168
	45	46	40	43	18	192
	71	61	56	34	23	245
	0	1	0	0	0	1
	32	26	40	40	4	142
	15	21	21	19	6	82
	0	0	20	0	0	20
	239	218	251	199	74	981

nber of collisions in the CI database by year and ision severity

on severity	2001	2002	2003	2004	2005	Total
ty damage only	66	63	72	56	23	280
tal injury	140	117	142	114	41	554
	33	38	37	29	10	147
	239	218	251	199	74	981

isions, vehicles and occupants linked between CI
abase and NCDB

s, vehicles and occupants	ACR5	ACR6	ASF3	ASF4	SID4	SID5	Total
of collisions in the study	289	340	133	79	78	62	981
of collisions linked	253	297	111	70	72	56	859
sions linked	88%	87%	83%	89%	92%	90%	88%
of vehicles in the CIRD in the linked	253	297	140	72	72	56	890
of vehicles linked	239	284	128	69	69	55	844
cles linked	94%	96%	91%	96%	96%	98%	95%
of occupants in the CIRD in the linked	353	420	213	143	126	100	1355
of occupants linked	291	339	160	95	107	88	1080
upants linked	82%	81%	75%	66%	85%	88%	80%

ry outcome

everity	Injury severity from NCDB					
	No injury	Minimal/ Minor	Serious	Fatality	Unknown	Total
y	220	96	2	0	36	354
	114	369	124	0	29	636
	2	1	4	**82**	1	**90**
	336	466	130	82	66	1080

traint use for injured/fatally injured occupants

nt use from	Restraint use from NCDB					
	Belted	Unbelted	Child restraint	Other/ Unknown	Not applicable	Total
ned	448	2	14	122	14	600
ained	59	28	0	32	4	123
wn	2	0	0	1	0	3
	509	30	14	155	18	726

uracy of NCDB by jurisdiction

	Collision severity	Injury outcome	Restraint use	Age	Number of occupants in the vehicle	Side impact collisions	Airbag depl
[redacted]	**76.6%**	**64.5%**	76.6%	**67.7%**	90.8%	50.0%	3.0%
[redacted]	87.8%	**75.0%**	83.3%	**78.7%**	93.6%	64.3%	32.0%
[redacted]	89.0%	**67.4%**	**58.3%**	90.5%	N/A	N/A	N/A
[redacted]	87.6%	79.8%	69.4%	82.4%	89.5%	53.6%	8.9%
[redacted]	**85.8%**	74.5%	**25.5%**	89.7%	95.3%	38.9%	N/A
[redacted]	91.4%	79.6%	74.2%	92.5%	91.4%	70.0%	47.1%
	86.6%	73.6%	61.9%	84.4%	92.1%	53.8%	17.0%

uracy of NCDB by collision severity

n severity in NCDB	Variable					
	Injury outcome	Restraint use	Age	Number of occupants in the vehicle	Side impact collisions	Air bag dep
amage only	55.2%	32.8%	83.2%	93.1%	50.0%	14.6
llision	75.0%	67.9%	84.0%	91.9%	50.0%	15.7
ision	89.6%	75.5%	87.3%	90.4%	66.7%	37.0
	73.6%	61.9%	84.4%	92.1%	53.8%	17.0

Conclusion/ Canadian data

- completeness of NCDB varies from 63% to 97% among the province/ territories fo rious injury collisions
- l jurisdictions tend to send more timely and complete data and there appears t off between the timeliness and completeness of the data in many jurisdictions.
- number of fatalities seems to be underestimated by 7 to 8% in NCDB.
- number of restrained injured or fatally injured occupants seems to be overestima ximately 12% in NCDB. As well, restraint use is missing or unknown in 30% of the restraint use was known in the CI data.
- ombination of “Collision configuration” and “First impact location” is recorded co DB for only 54% of side impact cases.
- bag deployment” is reported only 17% of the time in NCDB.
- ccuracy of NCDB is low for “property damage only” collisions compared to inj ollisions, particularly for the variables “Injury outcome” and “Restraint use”.

e Data Quality a strategic goal with performance measures attached