

# Reducing Alcohol-impaired Driving: Sobriety Checkpoints

## Summary Evidence Tables

### Studies evaluating the effectiveness of selective breath testing (SBT) checkpoints for decreasing crashes

Author, Year (Study period) Design suitability: design Quality of execution Evaluation setting	Intervention/Comparison details	Results/Other information	Summary value(s)	Follow-up Period
<p>Voas 1985<sup>1</sup> (1981-1984, monthly)</p> <p>Greatest: Interrupted time series with concurrent comparison</p> <p>Good</p> <p>Charlottesville, VA</p>	<p>Sobriety checkpoints operated 12/30/83 to 12/31/84; 94 total operations with 23,615 stops; most concentrated checkpoint program in the US, with ~116,000 inhabitants in target area; passive alcohol sensors used intermittently starting 9/84.</p> <p>Comparison to daytime and non-alcohol-involved crashes</p>	<p>Had-been-drinking crashes decreased by 15% (<math>p &lt; .05</math>) from monthly mean of 16.1 (net change = -14%, <math>p &lt; .01</math>);</p> <p>Nighttime crashes decreased by 8% (<math>p &gt; .05</math>) from monthly mean of 30.52 (net change = -13%, <math>p &gt; .05</math>);</p> <p>Use of passive sensors increased arrest rate from 1.05% to 3.21%</p>	<p>Other Crashes: -13%</p>	<p>12 months</p>
<p>Mercer, 1985<sup>2</sup> (1/80 – 6/84)</p> <p>Moderate: Interrupted time series</p> <p>Fair</p> <p>British Columbia, Canada</p>	<p>Sobriety checkpoints implemented 4/20 – 5/21/84; ~ 60,000 vehicles stopped; limited media coverage</p>	<p>Observed alcohol-related injury crashes in May 10% below expected value (N=251, <math>p &gt; .05</math>)</p> <p>Follow-up period extended 10 days beyond intervention.</p> <p>Author conducted evaluation of media impact on crashes, suggesting that a newspaper strike contributed to the nonsignificant results reported.</p>	<p>Injury Crashes: -10%</p>	<p>1 month</p>
<p>Lacey 1986<sup>3</sup> (1/80 – 12/84, monthly)</p> <p>Greatest: Interrupted time series with concurrent comparison</p> <p>Fair</p> <p>Clearwater/Largo, FL</p>	<p>Sobriety checkpoint program implemented 10/83 – 10/84 with increased police training and procedural changes; 12 operations in project period; \$75,000 media campaign</p> <p>Comparison to no-intervention sites</p>	<p>Change in proportion of crashes in intervention cities relative to combined intervention and comparison cities (<math>i/i+c</math>):</p> <p>Nighttime crashes – 8% decrease (N = 8298, <math>p &lt; .0001</math>);</p> <p>Had-been-drinking crashes – 20% decrease (N = 3844, <math>p &lt; .0005</math>)</p> <p>Similar results obtained by contingency table analysis on pre/post data</p>	<p>Other Crashes: -14%</p>	<p>15 months</p>
<p>Levy 1990<sup>4</sup> (2/83 – 7/86, monthly)</p> <p>Moderate: Interrupted time series</p> <p>Fair</p> <p>Bergen County, NJ</p>	<p>Sobriety checkpoint program implemented 5/83 with ~40,000 stops/year; impact of 2 publicity campaigns also estimated;</p>	<p>Overall reduction of 29% in single-vehicle nighttime crashes attributed to checkpoint activity (<math>p &lt; .05</math>);</p> <p>Significant reduction in single vehicle nighttime fatal crashes (no effect size given, <math>p &lt; .05</math>)</p> <p>Serious problems of colinearity with publicity campaigns in model</p>	<p>Other Crashes: -29%</p>	<p>39 months</p>

Author, Year (Study period) Design suitability: design Quality of execution Evaluation setting	Intervention/Comparison details	Results/Other information	Summary value(s)	Follow-up Period
Wells 1992 <sup>b</sup> (11/86 – 8/90)  Greatest: Before/after with comparison (ABAB design)  Fair  Binghamton, NY	Sobriety checkpoints with use of passive alcohol sensors; 6 waves totaling 72 checkpoints over 2 years; multimedia publicity campaign  Comparison to periods between checkpoints	Injury crashes decreased 16% from 298, $\chi^2$ , $p < .05$ (net change = -23%);  Late-night crashes decreased 21% from 315, $\chi^2$ , $p < .01$ (net change = -24%);  Total crashes decreased 6% from 2,802, $\chi^2$ , $p < .05$ (net change = -1%);  Checkpoint/no checkpoint period comparison suggests that effects dissipate rapidly in the absence of checkpoint activity	Injury Crashes: -23%  Other Crashes: -24%	N/A (multiple waves)
Castle, 1995 <sup>b</sup> (1/83 – 12/94)  Greatest: Time series with concurrent comparison  Fair  New Mexico	Sobriety checkpoints initiated statewide in 12/93 with target of 50% of 15-34 year-old drivers passing through per year; a comprehensive set of other DUI reforms also implemented in 1993  Comparison to all fatal crashes	For months during which checkpoints were active, alcohol-involved fatal crashes decreased 21% from a baseline of 18/month; relative to all fatal crashes the net change was -26% ( $t = -2.03$ , $p < .05$ )  Perceptions that drunk drivers were at greater risk of being stopped "in the past year" increased by 1 percentage point among men and 22 percentage points among women.	Fatal Crashes: -26%	13 months
Stuster 1995 <sup>c</sup> (1987-1993, monthly)  Greatest: Interrupted time series on non-randomized trial  Fair  Four California cities	Sobriety checkpoints evaluated in 4 cities; 18 operations per city in 9 month period; staffing level and mobility varied; all intervention communities implemented publicity campaigns;  Comparison to no-intervention site and to crashes not involving alcohol	Changes in injury crashes involving alcohol: Modesto – decline of 9.3% from baseline of 11.70 per month ( $p = .008$ ; net change = -21.5%) Ventura – decline of 39.7% from baseline of 6.66 per month ( $p = .014$ ; net change = -31.6%) Visalia – decline of 14.7% from baseline of 6.28 per month ( $p = .018$ ; net change = -17.5%) Across these three cities, median net change = -21.5%  In Santa Rosa, the proportion of injury crashes that were alcohol-involved decreased 19%, but insufficient data were available for time-series analysis.  Well-publicized roving patrols produced similar effects to checkpoints (net change = -13.4%)	Injury Crashes: -21%	9 months
Jones 1995 <sup>b</sup> (1/88 to 7/92, monthly)  Moderate: Interrupted time series  Fair  Wichita, KS	Sobriety checkpoints and saturation patrols with multimedia publicity within a program targeting speeding, safety belt use, and DUI implemented 9/91; degree of change in checkpoint activity not reported	Nighttime single vehicle injury crashes decreased 23% (from 30/month, $p < .05$ )  Nighttime single vehicle crashes decreased 35% (from 69/month, $p < .05$ );  48% of adults surveyed ( $n = 635$ ): reported a perceived increase in DUI enforcement post-intervention vs. 44% pre ( $p = .18$ )	Injury Crashes: -23%  Other Crashes: -35%	11 months

<b>Author, Year (Study period) Design suitability: design Quality of execution Evaluation setting</b>	<b>Intervention/Comparison details</b>	<b>Results/Other information</b>	<b>Summary value(s)</b>	<b>Follow-up Period</b>
Mercer, 1996 <sup>9</sup> (7/6/95 – 12/7/95)  Greatest: Time series with concurrent comparison  Fair  British Columbia (urban)	Sobriety checkpoints operated 7/6 to 12/7/95; 21% of the driving population tested per month  Comparison to areas surrounding the enforcement jurisdictions.	Proportion of insurance claims for single-vehicle injury crashes involving male drivers aged 21 to 40 years decreased by 10% (net change = -19%)  Percentage of drivers surveyed with BACs > .08% decreased from 3.2% to 1.1% (p < .01).	Injury Crashes: -19%	5 months
Lacey 1999 <sup>10</sup> (1/88 – 12/96, monthly)  Greatest: Interrupted time series with concurrent comparison  Good  Tennessee	Sobriety checkpoint campaign conducted 4/94- 3/95; 882 checkpoints with 144,299 drivers stopped; intensive multimedia publicity campaign;  Comparison to adjacent states	Alcohol-related fatal crashes (BAC > .10) decreased by 20% (9 crashes/month, p < .05);  Nighttime single-vehicle injury crashes decreased 5% (p < .05)  Self-reported drinking/driving decreased over program period from 8.6% to 6.0% of survey sample.  BRFSS data indicate >90% support for checkpoints.	Fatal Crashes: -20%  Injury Crashes: -5%	45 months
Voas 1997 <sup>11</sup> (7/91 – 12/95, quarterly)  Greatest: Time series with concurrent comparison  Fair  3 communities in NC, SC, and CA	Sobriety checkpoints initiated as part of a comprehensive community alcohol-related trauma project. Intensity and timing of checkpoints varied by community. Media advocacy training was provided to increase free publicity, but minimal advertising was purchased.  Comparison to matched communities.	Checkpoints were associated with an overall reduction in single vehicle nighttime crashes across the 3 communities (p < .05).  A 10% increase in intervention intensity was estimated to result in a .71% decrease in single vehicle nighttime crashes.  Results are confounded due to overlap in media markets across intervention and comparison communities and checkpoint activities in comparison communities. A zero tolerance law for young drivers was implemented in CA during the intervention period.	N/A	24 months

## Studies evaluating the effectiveness of random breath testing (RBT) checkpoints for decreasing crashes

Author, Year (Study period) Design suitability: design Quality of execution Evaluation setting	Intervention/Comparison details	Results/Other information	Summary value(s)	Follow-up Period
Ross 1981 <sup>12</sup> (1/73 - 10/80, monthly)  Moderate: Interrupted time series  Fair  France	Change in laws authorizing RBT as well as license sanctions; .08 BAC limit; 335,449 stops from inception to 1/31/79; extensive unpaid publicity Comparison to pre-intervention time series	Crash-related deaths decreased 14% from series mean of 1,111 (p < .05)  Crash-related injuries decreased 12.5% from series mean of 29,468 (p < .05)  Reported result estimates temporary effect of ~ one year duration  Low detection rate relative to expectations from BAC surveys suggests lax implementation of RBT	Fatal Crashes: -14%  Injury Crashes: -12%	27 months
McLean, 1984 <sup>13</sup> (1/79 - 12/82)  Greatest: Before/after with concurrent comparison  Fair  South Australia	RBT implemented 10/15/81; limited information provided on levels of enforcement and publicity.  Comparison of late night crashes to those during the remainder of the day.	Late night serious injury crashes showed a:  - net decrease of 6% in metropolitan Adelaide (n = 817) - net increase of 6% in rural South Australia (n = 566) - net decrease of 1% statewide (n = 1383).  Roadside survey results and observation of drivers approaching checkpoints suggest that many drinking drivers successfully avoided checkpoints.	Injury Crashes: -1%	13 months
Hardes 1985 <sup>14</sup> (1977-1983, yearly)  Moderate: Time series  Fair  Hunter Health Region, NSW	RBT implemented 12/17/1982;  Hospital admissions following intervention compared to prior trend	Crash-related admissions decreased 19% from extrapolation of trend from 1977 (1373 observed vs. 1697 expected);  No inferential statistics (N > 1000/year)  Decline in admissions was 31% for males, 8% for females	Injury Crashes: -19%	12 months
Armour 1985 <sup>15</sup> (10/24-12/31, 1981-1983)  Greatest: Before/after with concurrent comparison  Fair  Melbourne, Australia	RBT blitz campaign; enforcement increased by ~140 man-hours/week and backed by \$166,000 mass media campaign  Comparison to similar period in previous two years adjusted for daytime crashes	Nighttime injury crashes decreased 18% from mean of 262.5 (net change = -18%, $\chi^2 = 3.97$ , p<.01); Weekend nighttime injury crashes decreased 25% from mean of 162 (net change = -24%, $\chi^2 = 5.21$ , p<.01)  Authors present suggestive evidence that afternoon/early evening operations are as effective as late night	Injury Crashes: -18%	2 months
Arthurson 1985 <sup>16</sup> (1/81 to 12/84)  Greatest: Before/after with concurrent comparison  Fair  NSW	RBT implemented 12/82; one in three drivers tested yearly; >AU\$ 1 million/year publicity campaign  Comparison to other mainland Australian states	Fatal crashes decreased 21% following RBT (net change = -13%)  Net change significant at p<.05 for 3 of 4 individual state comparisons  Number of observations not specified	Fatal Crashes: -13%	24 months

Author, Year (Study period) Design suitability: design Quality of execution Evaluation setting	Intervention/Comparison details	Results/Other information	Summary value(s)	Follow-up Period
Homel 1988 <sup>17</sup> (1977 – 1987, weekly)  Moderate: Interrupted time series  Good  NSW	RBT implemented 12/17/1982; one in three licensed drivers tested; extensive publicity campaign  Comparison to pre-intervention time series	Drivers killed with BAC > .05 decreased 36% from weekly mean of 4.36 (p < .05)  'Classic' alcohol-related crashes decreased 35% from weekly mean of 13.43 (p<.05)  Total fatal crashes decreased 22% from weekly mean of 22.12 (p < .05)  Support for RBT increased from 64% in 1982 to 97% in 1987  86% of drinkers endorsed 'higher' chances of being arrested following RBT	Fatal Crashes: -36%  Injury Crashes: -35%	60 months
McCaul 1990 <sup>18</sup> (seven week periods before/after Easter, 1987 & 1983)  Moderate: Before/after with non-concurrent comparison  Fair  Adelaide, South Australia	RBT blitz campaign implemented immediately after Easter, 1987; 96% increase in stops accompanied by an extensive media campaign  Comparison to immediately preceding period and similar period in 1983	Proportion of drivers (N=11,488) above:  Zero BAC decreased 20.3% (95% CI: -27.4, -13.1) from baseline of .25 (net change = -13.4%)  .08 BAC decreased 34.4% (95% CI: -50.0, -18.8) from baseline of .05 (net change = -24.3%)  Authors speculate that publicity regarding enforcement was primarily responsible for the observed effect.	N/A	2 months
Cameron 1992 <sup>19</sup> (1/83 – 12/91, monthly)  Greatest: Interrupted time series with concurrent comparison  Fair  Victoria, Australia	Transition to bus-based RBT operations beginning late 1989 and continuing through November, 1990; > 100% increase in drivers tested (~70,000 tests/month); multimillion dollar publicity campaign promoted transition  Comparison to NSW	Injury crashes during 'high alcohol times': 1990 - decreased 30% (net change = -18%; 90% CI: -24.1, -10.9) 1991 – decreased 41.3% (net change = -24%; 90% CI: -35.5, -11.2)  Similar results obtained for separate analyses of metropolitan and rural areas	Injury Crashes: -21%	24 months
Henstridge, 1997 <sup>20</sup> (1976-1992, daily)  Moderate: Interrupted time series  Fair  New South Wales	RBT implemented 12/17/1982; evaluated in a loglinear model with numerous covariates.  Comparison to pre-intervention time series	RBT associated with a median: - 15% reduction in fatal crashes; -- 7% reduction in serious injury crashes; 15% reduction in single-vehicle nighttime crashes.  Authors modeled the impact of a .05 BAC law implemented prior to RBT as well as seasonal factors, road usage, weather, and economic factors.	Fatal Crashes: -15%  Injury Crashes: -7%  Other Crashes: -15%	120 months

Author, Year (Study period) Design suitability: design Quality of execution Evaluation setting	Intervention/Comparison details	Results/Other information	Summary value(s)	Follow-up Period
Henstridge, 1997 <sup>20</sup> (1980-1992, daily)  Moderate: Interrupted time series  Fair  Western Australia	RBT implemented 10/1988; evaluated in a loglinear model with numerous covariates.  Comparison to pre-intervention time series	RBT associated with a: - 28% reduction in fatal crashes; - 13% reduction in serious injury crashes; - 26% reduction in single-vehicle nighttime crashes.  Authors modeled the impact of SBT checkpoints implemented prior to RBT checkpoints, as well as seasonal factors, road usage, weather, and economic factors.	Fatal Crashes: -28%  Injury Crashes: -13%  Other Crashes: -26%	51 months
Henstridge, 1997 <sup>20</sup> (1980-1992, daily)  Moderate: Interrupted time series  Fair  Queensland	RBT implemented 12/1988; evaluated in a loglinear model with numerous covariates.  Comparison to pre-intervention time series	RBT associated with a: - 35% reduction in fatal crashes; - 19% reduction in serious injury crashes;  Authors modeled the impact of a .05 BAC law and SBT checkpoints implemented prior to RBT checkpoints, as well as seasonal factors, road usage, weather, and economic factors.	Fatal Crashes: -35%  Injury Crashes: -19%	49 months
Cameron, 1997 <sup>21</sup> (11/93 – 12/94)  Greatest: Interrupted time series with concurrent comparison  Fair  Rural Victoria	Increased RBT enforcement beginning 11/93; 74% increase in stops;  Comparison to rural NSW	Injury crashes during 'high alcohol times' decreased 9% (95% CI: -17.71, -0.42) (net change = -15%)  Comparison of regions of RBT activity vs. inactivity also indicated significant intervention effect	Injury Crashes: -15%	14 months

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