

Passed

1 Senator moves to amend S.F. No. 0004 as follows:

2 Delete everything after the enacting clause and insert:

3 "Section 1. Minnesota Statutes 2004, section 239.791,
4 subdivision 1, is amended to read:

5 Subdivision 1. [MINIMUM ETHANOL CONTENT REQUIRED.] (a)

6 Except as provided in subdivisions 10 to 14, a person
7 responsible for the product shall ensure that all gasoline sold
8 or offered for sale in Minnesota must contain at least 10.0
9 percent denatured ethanol by volume.

10 (b) For purposes of enforcing the minimum ethanol
11 requirement of paragraph (a), a gasoline/ethanol blend will be
12 construed to be in compliance if the ethanol content, exclusive
13 of denaturants and permitted contaminants, comprises not less
14 than 9.2 percent by volume and not more than 10.0 percent by
15 volume of the blend as determined by an appropriate United
16 States Environmental Protection Agency or American Society of
17 Testing Materials standard method of analysis of alcohol/ether
18 content in motor fuels.

19 (c) This subdivision expires on January 1, 2012, if
20 subdivision 1a is effective on that date.

21 Sec. 2. Minnesota Statutes 2004, section 239.71, is
22 amended by adding a subdivision to read:

23 Subd. 1a. [MINIMUM ETHANOL CONTENT REQUIRED.] (a) Except
24 as provided in subdivisions 10 to 14, on January 1, 2012, and
25 thereafter, a person responsible for the product shall ensure
26 that all gasoline sold or offered for sale in Minnesota must
27 contain at least 20 percent denatured ethanol by volume.

28 (b) For purposes of enforcing the minimum ethanol
29 requirement of paragraph (a), a gasoline/ethanol blend will be
30 construed to be in compliance if the ethanol content, exclusive
31 of denaturants and permitted contaminants, comprises not less
32 than 18.4 percent by volume and not more than 20 percent by
33 volume of the blend as determined by an appropriate United
34 States Environmental Protection Agency or American Society of
35 Testing Materials standard method of analysis of alcohol content
36 in motor fuels.

1 (c) This subdivision expires on December 31, 2010, if by
2 that date the commissioner of agriculture certifies and
3 publishes the certification in the State Register that at least
4 20 percent of the volume of gasoline sold in the state is
5 denatured ethanol.

6 Sec. 3. [239.7911] [PETROLEUM REPLACEMENT PROMOTION.]

7 Subdivision 1. [PETROLEUM REPLACEMENT GOAL.] The petroleum
8 replacement goal of the State of Minnesota is that at least 20
9 percent of the liquid fuel sold in the state is derived from
10 renewable sources by December 31, 2015.

11 Subd. 2. [PROMOTION OF RENEWABLE LIQUID FUELS.] (a) The
12 commissioner of agriculture, in consultation with the
13 commissioners of commerce and pollution control, shall identify
14 and implement activities necessary for the widespread use of
15 renewable liquid fuels in the state. Beginning November 1,
16 2005, and continuing through 2015, the commissioners, or their
17 designees, shall work with representatives from the renewable
18 fuels industry, petroleum retailers, refiners, automakers, small
19 engine manufacturers, and other interested groups, to develop
20 annual recommendations for administrative and legislative action.

21 (b) The activities of the commissioners under this
22 subdivision shall include, but not be limited to:

23 (1) developing recommendations for incentives for retailers
24 to install equipment necessary for dispensing renewable liquid
25 fuels to the public;

26 (2) obtaining federal approval for the use of E20 as
27 gasoline;

28 (3) developing recommendations for ensuring that motor
29 vehicles and small engine equipment have access to an adequate
30 supply of fuel;

31 (4) working with the owners and operators of large
32 corporate automotive fleets in the state to increase their use
33 of renewable fuels; and

34 (5) working to maintain an affordable retail price for
35 liquid fuels.

36 [EFFECTIVE DATE.] This section is effective the day

1 following final enactment."

2 Delete the title and insert:

3 "A bill for an act relating to agriculture; increasing
4 minimum ethanol content required for gasoline sold in the state;
5 establishing a petroleum replacement goal; amending Minnesota
6 Statutes 2004, sections 239.71, by adding a subdivision;
7 239.791, subdivision 1; proposing coding for new law in
8 Minnesota Statutes, chapter 239."

Senators Sams, Kubly, Skoe and Langseth introduced--

S.F. No. 4: Referred to the Committee on Agriculture, Veterans and Gaming.

1 A bill for an act

2 relating to agriculture; increasing minimum ethanol
3 content required for gasoline sold in the state;
4 amending Minnesota Statutes 2004, sections 239.761,
5 subdivision 4; 239.791, subdivision 1; 296A.01,
6 subdivisions 2, 25.

7 BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF MINNESOTA:

8 Section 1. Minnesota Statutes 2004, section 239.761,
9 subdivision 4, is amended to read:

10 Subd. 4. [GASOLINE BLENDED WITH ETHANOL.] (a) Gasoline may
11 be blended with up to ten 20 percent, by volume, agriculturally
12 derived, denatured ethanol that complies with the requirements
13 of subdivision 5.

14 (b) A gasoline-ethanol blend must:

15 (1) comply with the volatility requirements in Code of
16 Federal Regulations, title 40, part 80;

17 (2) comply with ASTM specification D4814-01, or the
18 gasoline base stock from which a gasoline-ethanol blend was
19 produced must comply with ASTM specification D4814-01; and

20 (3) not be blended with casinghead gasoline, absorption
21 gasoline, condensation gasoline, drip gasoline, or natural
22 gasoline after the gasoline-ethanol blend has been sold,
23 transferred, or otherwise removed from a refinery or terminal.

24 Sec. 2. Minnesota Statutes 2004, section 239.791,
25 subdivision 1, is amended to read:

26 Subdivision 1. [MINIMUM ETHANOL CONTENT REQUIRED.] (a)

1 Except as provided in subdivisions 10 to 14, a person
2 responsible for the product shall ensure that all gasoline sold
3 or offered for sale in Minnesota must contain:

4 (1) at least ~~10.0~~ ten percent denatured ethanol by volume;
5 and

6 (2) at least 20 percent denatured ethanol by volume
7 beginning the earlier of:

8 (i) January 1, 2010; or

9 (ii) 60 days after the governor publishes notice in the
10 State Register that at least 50 percent of the new model
11 automobiles offered for sale in the state are warrantied for
12 fuel with 20 percent ethanol by volume.

13 (b) For purposes of enforcing the minimum ethanol
14 requirement of paragraph (a), clause (1), a gasoline/ethanol
15 blend will be construed to be in compliance if the ethanol
16 content, exclusive of denaturants and permitted contaminants,
17 comprises not less than 9.2 percent by volume and not more than
18 ~~10.0~~ ten percent by volume of the blend as determined by an
19 appropriate United States Environmental Protection Agency or
20 American Society of Testing Materials standard method of
21 analysis of alcohol/ether content in motor fuels.

22 (c) For purposes of enforcing the minimum ethanol
23 requirement of paragraph (a), clause (2), a gasoline/ethanol
24 blend will be construed to be in compliance if the ethanol
25 content, exclusive of denaturants and permitted contaminants,
26 comprises not less than 18.4 percent by volume and not more than
27 20 percent by volume of the blend as determined by an
28 appropriate United States Environmental Protection Agency or
29 American Society of Testing Materials standard method of
30 analysis of alcohol/ether content in motor fuels.

31 Sec. 3. Minnesota Statutes 2004, section 296A.01,
32 subdivision 2, is amended to read:

33 Subd. 2. [AGRICULTURAL ALCOHOL GASOLINE.] "Agricultural
34 alcohol gasoline" means a gasoline-ethanol blend of up to ten 20
35 percent agriculturally derived fermentation ethanol derived from
36 agricultural products, such as potatoes, cereal, grains, cheese

1 whey, sugar beets, forest products, or other renewable
2 resources, that:

3 (1) meets the specifications in ASTM specification
4 D4806-01; and

5 (2) is denatured as specified in Code of Federal
6 Regulations, title 27, parts 20 and 21.

7 Sec. 4. Minnesota Statutes 2004, section 296A.01,
8 subdivision 25, is amended to read:

9 Subd. 25. [GASOLINE BLENDED WITH ETHANOL.] "Gasoline
10 blended with ethanol" means gasoline blended with up to ~~ten~~ 20
11 percent, by volume, agriculturally derived, denatured ethanol.
12 The blend must comply with the volatility requirements in Code
13 of Federal Regulations, title 40, part 80. The blend must also
14 comply with ASTM specification D4814-01, or the gasoline base
15 stock from which a gasoline-ethanol blend was produced must
16 comply with ASTM specification D4814-01; and the
17 gasoline-ethanol blend must not be blended with casinghead
18 gasoline, absorption gasoline, condensation gasoline, drip
19 gasoline, or natural gasoline after the gasoline-ethanol blend
20 has been sold, transferred, or otherwise removed from a refinery
21 or terminal. The blend need not comply with ASTM specification
22 D4814-01 if it is subjected to a standard distillation test.
23 For a distillation test, a gasoline-ethanol blend is not
24 required to comply with the temperature specification at the 50
25 percent liquid recovery point, if the gasoline from which the
26 gasoline-ethanol blend was produced complies with all of the
27 distillation specifications.

Senators Kubly, Sams, Dille, Frederickson and Langseth introduced--
S.F. No. 85: Referred to the Committee on Agriculture, Veterans and Gaming.

1 A bill for an act

2 relating to agriculture; increasing minimum ethanol
3 content required for gasoline sold in this state;
4 requiring motor vehicle manufacturers' warranties to
5 extend to motor vehicles using certain fuels; amending
6 Minnesota Statutes 2004, sections 239.761, subdivision
7 4; 239.791, subdivision 1; 296A.01, subdivisions 2,
8 25; 325F.665, by adding a subdivision.

9 BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF MINNESOTA:

10 Section 1. Minnesota Statutes 2004, section 239.761,
11 subdivision 4, is amended to read:

12 Subd. 4. [GASOLINE BLENDED WITH ETHANOL.] (a) Gasoline may
13 be blended with up to ~~ten~~ 20 percent, by volume, agriculturally
14 derived, denatured ethanol that complies with the requirements
15 of subdivision 5.

16 (b) A gasoline-ethanol blend must:

17 (1) comply with the volatility requirements in Code of
18 Federal Regulations, title 40, part 80;

19 (2) comply with ASTM specification D4814-01, or the
20 gasoline base stock from which a gasoline-ethanol blend was
21 produced must comply with ASTM specification D4814-01; and

22 (3) not be blended with casinghead gasoline, absorption
23 gasoline, condensation gasoline, drip gasoline, or natural
24 gasoline after the gasoline-ethanol blend has been sold,
25 transferred, or otherwise removed from a refinery or terminal.

26 Sec. 2. Minnesota Statutes 2004, section 239.791,
27 subdivision 1, is amended to read:

1 Subdivision 1. [MINIMUM ETHANOL CONTENT REQUIRED.] (a)
2 Except as provided in subdivisions 10 to 14, a person
3 responsible for the product shall ensure that all gasoline sold
4 or offered for sale in Minnesota must contain:

5 (1) at least ~~10.0~~ ten percent denatured ethanol by volume;
6 and

7 (2) at least 20 percent denatured ethanol by volume
8 beginning within one year of a waiver request under section 211
9 (f) of the Clean Air Act being granted by the United States
10 Environmental Protection Agency.

11 (b) For purposes of enforcing the minimum ethanol
12 requirement of paragraph (a), clause (1), a gasoline/ethanol
13 blend will be construed to be in compliance if the ethanol
14 content, exclusive of denaturants and permitted contaminants,
15 comprises not less than 9.2 percent by volume and not more than
16 ~~10.0~~ ten percent by volume of the blend as determined by an
17 appropriate United States Environmental Protection Agency or
18 American Society of Testing Materials standard method of
19 analysis of alcohol/ether content in motor fuels.

20 (c) For purposes of enforcing the minimum ethanol
21 requirement of paragraph (a), clause (2), a gasoline/ethanol
22 blend will be construed to be in compliance if the ethanol
23 content, exclusive of denaturants and permitted contaminants,
24 comprises not less than 18.4 percent by volume and not more than
25 20 percent by volume of the blend as determined by an
26 appropriate United States Environmental Protection Agency or
27 American Society of Testing Materials standard method of
28 analysis of alcohol/ether content in motor fuels.

29 Sec. 3. Minnesota Statutes 2004, section 296A.01,
30 subdivision 2, is amended to read:

31 Subd. 2. [AGRICULTURAL ALCOHOL GASOLINE.] "Agricultural
32 alcohol gasoline" means a gasoline-ethanol blend of up to ~~ten~~ 20
33 percent agriculturally derived fermentation ethanol derived from
34 agricultural products, such as potatoes, cereal, grains, cheese
35 whey, sugar beets, forest products, or other renewable
36 resources, that:

1 (1) meets the specifications in ASTM specification
2 D4806-01; and

3 (2) is denatured as specified in Code of Federal
4 Regulations, title 27, parts 20 and 21.

5 Sec. 4. Minnesota Statutes 2004, section 296A.01,
6 subdivision 25, is amended to read:

7 Subd. 25. [GASOLINE BLENDED WITH ETHANOL.] "Gasoline
8 blended with ethanol" means gasoline blended with up to ~~ten~~ 20
9 percent, by volume, agriculturally derived, denatured ethanol.
10 The blend must comply with the volatility requirements in Code
11 of Federal Regulations, title 40, part 80. The blend must also
12 comply with ASTM specification D4814-01, or the gasoline base
13 stock from which a gasoline-ethanol blend was produced must
14 comply with ASTM specification D4814-01; and the
15 gasoline-ethanol blend must not be blended with casinghead
16 gasoline, absorption gasoline, condensation gasoline, drip
17 gasoline, or natural gasoline after the gasoline-ethanol blend
18 has been sold, transferred, or otherwise removed from a refinery
19 or terminal. The blend need not comply with ASTM specification
20 D4814-01 if it is subjected to a standard distillation test.
21 For a distillation test, a gasoline-ethanol blend is not
22 required to comply with the temperature specification at the 50
23 percent liquid recovery point, if the gasoline from which the
24 gasoline-ethanol blend was produced complies with all of the
25 distillation specifications.

26 Sec. 5. Minnesota Statutes 2004, section 325F.665, is
27 amended by adding a subdivision to read:

28 Subd. 14. [REQUIRED MANUFACTURERS' WARRANTY.] A
29 manufacturer's express warranty of new motor vehicles offered
30 for sale or lease in this state must include coverage for motor
31 vehicles that use fuel blended with up to 20 percent, by volume,
32 of agriculturally derived, denatured ethanol.

33 Sec. 6. [EFFECTIVE DATE.]

34 Section 5 is effective January 1, 2007.

Senator Vickerman introduced--

S.F. No. 143: Referred to the Committee on Agriculture, Veterans and Gaming.

A bill for an act

relating to agriculture; increasing minimum ethanol content required for gasoline sold in the state; amending Minnesota Statutes 2004, sections 239.761, subdivision 4; 239.791, subdivision 1; 296A.01, subdivisions 2, 25.

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF MINNESOTA:

Section 1. Minnesota Statutes 2004, section 239.761, subdivision 4, is amended to read:

Subd. 4. [GASOLINE BLENDED WITH ETHANOL.] (a) Gasoline may be blended with up to ten 20 percent, by volume, agriculturally derived, denatured ethanol that complies with the requirements of subdivision 5.

(b) A gasoline-ethanol blend must:

(1) comply with the volatility requirements in Code of Federal Regulations, title 40, part 80;

(2) comply with ASTM specification D4814-01, or the gasoline base stock from which a gasoline-ethanol blend was produced must comply with ASTM specification D4814-01; and

(3) not be blended with casinghead gasoline, absorption gasoline, condensation gasoline, drip gasoline, or natural gasoline after the gasoline-ethanol blend has been sold, transferred, or otherwise removed from a refinery or terminal.

Sec. 2. Minnesota Statutes 2004, section 239.791, subdivision 1, is amended to read:

Subdivision 1. [MINIMUM ETHANOL CONTENT REQUIRED.] (a)

1 Except as provided in subdivisions 10 to 14, a person
2 responsible for the product shall ensure that all gasoline sold
3 or offered for sale in Minnesota must contain:

4 (1) at least ~~10.0~~ ten percent denatured ethanol by volume;
5 and

6 (2) at least 20 percent denatured ethanol by volume
7 beginning the earlier of:

8 (i) January 1, 2010; or

9 (ii) 60 days after the governor publishes notice in the
10 State Register that at least 50 percent of the new model
11 automobiles offered for sale in the state are warrantied for
12 fuel with 20 percent ethanol by volume.

13 (b) For purposes of enforcing the minimum ethanol
14 requirement of paragraph (a), clause (1), a gasoline/ethanol
15 blend will be construed to be in compliance if the ethanol
16 content, exclusive of denaturants and permitted contaminants,
17 comprises not less than 9.2 percent by volume and not more than
18 ~~10.0~~ ten percent by volume of the blend as determined by an
19 appropriate United States Environmental Protection Agency or
20 American Society of Testing Materials standard method of
21 analysis of alcohol/ether content in motor fuels.

22 (c) For purposes of enforcing the minimum ethanol
23 requirement of paragraph (a), clause (2), a gasoline/ethanol
24 blend will be construed to be in compliance if the ethanol
25 content, exclusive of denaturants and permitted contaminants,
26 comprises not less than 18.4 percent by volume and not more than
27 20 percent by volume of the blend as determined by an
28 appropriate United States Environmental Protection Agency or
29 American Society of Testing Materials standard method of
30 analysis of alcohol/ether content in motor fuels.

31 Sec. 3. Minnesota Statutes 2004, section 296A.01,
32 subdivision 2, is amended to read:

33 Subd. 2. [AGRICULTURAL ALCOHOL GASOLINE.] "Agricultural
34 alcohol gasoline" means a gasoline-ethanol blend of up to ten 20
35 percent agriculturally derived fermentation ethanol derived from
36 agricultural products, such as potatoes, cereal, grains, cheese

1 whey, sugar beets, forest products, or other renewable
2 resources, that:

3 (1) meets the specifications in ASTM specification
4 D4806-01; and

5 (2) is denatured as specified in Code of Federal
6 Regulations, title 27, parts 20 and 21.

7 Sec. 4. Minnesota Statutes 2004, section 296A.01,
8 subdivision 25, is amended to read:

9 Subd. 25. [GASOLINE BLENDED WITH ETHANOL.] "Gasoline
10 blended with ethanol" means gasoline blended with up to ten 20
11 percent, by volume, agriculturally derived, denatured ethanol.
12 The blend must comply with the volatility requirements in Code
13 of Federal Regulations, title 40, part 80. The blend must also
14 comply with ASTM specification D4814-01, or the gasoline base
15 stock from which a gasoline-ethanol blend was produced must
16 comply with ASTM specification D4814-01; and the
17 gasoline-ethanol blend must not be blended with casinghead
18 gasoline, absorption gasoline, condensation gasoline, drip
19 gasoline, or natural gasoline after the gasoline-ethanol blend
20 has been sold, transferred, or otherwise removed from a refinery
21 or terminal. The blend need not comply with ASTM specification
22 D4814-01 if it is subjected to a standard distillation test.
23 For a distillation test, a gasoline-ethanol blend is not
24 required to comply with the temperature specification at the 50
25 percent liquid recovery point, if the gasoline from which the
26 gasoline-ethanol blend was produced complies with all of the
27 distillation specifications.

1 Senator Vickerman from the Committee on Agriculture,
2 Veterans and Gaming, to which was referred

3 S.F. No. 116: A bill for an act relating to gambling;
4 appropriating money for compulsive gambling prevention and
5 education.

6 Reports the same back with the recommendation that the bill
7 do pass and be re-referred to the Committee on Finance. Report
8 adopted.

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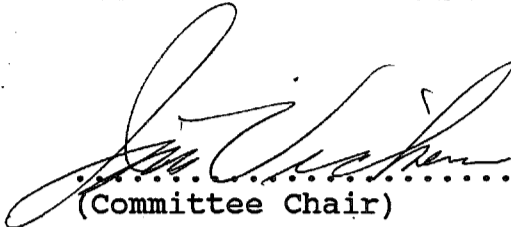
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.....
(Committee Chair)

January 12, 2005.....
(Date of Committee recommendation)

Senate Agriculture, Veterans and Gaming Committee
Wednesday, January 12, 2005
3:00 p.m.
Room 112, Capitol

AGENDA

“Problem Gambling in Minnesota: An Overview”

Panel: “History of Gaming in Minnesota” - Don Feeney, Board Member, Northstar Problem Gambling Alliance, Research and Planning Director, Minnesota State Lottery; “Problem Gambling in Minnesota” - Dr. Randy Stinchfield, University of Minnesota, School of Medicine/Psychiatry; “Services in Minnesota” - Kelly Reynolds, Director, Minnesota Problem Gambling Hotline; “Treatment in Minnesota” - Phil Kelly, Administrator Project Turnabout, President, Northstar Problem Gambling Alliance.

**Additional Witness on Compulsive Gambling:
Brian Rusche, Joint Religious Legislative Coalition**

S.F. 116-Solon: Appropriating money for compulsive gambling.

Betty George, Executive Director, MN Council on Compulsive Gambling; Statewide Adolescent Gambling Addiction Prevention and Education Program.

S.F. 4-Sams: Increasing minimum ethanol content for gasoline sold in the state.

S.F. 85-Kubly: Increasing minimum ethanol content for gasoline sold in the state.

S.F. 143-Vickerman: Increasing minimum ethanol content for gasoline sold in the state.

**Ralph Groschen, MN Dept. of Agriculture
Perry Aasness, MN Department of Agriculture
Valerie Jerich, MN Ethanol Producers Association
Steve Ladlie, Board Member Lake Crystal Northstar Ethanol Plant
Rod Jorgenson, President, MN Coalition for Ethanol**

(Over)

Bill Lee, Plant Manager, Chippewa Valley Ethanol Coop

Ron Lamberty, American Coalition for Ethanol

Doug Peterson, President, MN Farmers Union

Bob Hrogman,

Opposed:

Diane Koebele, Flint Hills Resources

Alyssa Schlander, Minnesota Auto Dealers Association

Sandy Neren, Alliance of Automobile Manufacturers

David Blatnik, Marathon Ashland Petroleum and Super America

Darrel Bunge, American Petroleum Institute

Senator Solon introduced--

S.F. No. 116: Referred to the Committee on Finance.

1 A bill for an act
2 relating to gambling; appropriating money for
3 compulsive gambling prevention and education.
4 BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF MINNESOTA:
5 Section 1. [APPROPRIATION.]
6 \$150,000 in fiscal year 2006 and \$150,000 in fiscal year
7 2007 are appropriated from the lottery prize fund to the
8 commissioner of human services for a grant to a compulsive
9 gambling council located in St. Louis County. The gambling
10 council must provide a statewide compulsive gambling prevention
11 and education project for adolescents. The unencumbered balance
12 of the appropriation from the lottery prize fund in the first
13 year of the biennium does not cancel but is available for the
14 second year.

Minnesota Problem Gambling Fact Sheet

What is Problem Gambling?

Problem gambling is a broad term referring to gambling that interferes with a person's life.

Pathological Gambling is a clinical diagnosis and has specific behavioral criteria:

Pathological gambling is a serious addiction that is indicated by two cardinal signs: preoccupation with gambling; loss of control of one's gambling (e.g., continued gambling in spite of adverse consequences). It is a small proportion of people who are pathological gamblers. But for those affected by pathological gambling, it can have devastating effects on both the person with the addiction and their family, including breakdown of the family, financial ruin, and in some cases suicide.

How many MN adults gamble? (Based upon the 2004 Minnesota Lottery/St. Cloud State University survey)

94% have gambled in the lifetime;

83% have gambled in the past year.

What forms of gambling are most popular? (Based upon the 2004 Lottery/SCSU survey, past year gambling)

Lottery was played by 60%

Indian casino gambling was 41%

Pull tabs were played by 26%

How many problem gamblers are there?

1990 telephone survey of 1,251 MN adults: Prevalence rate, using the South Oaks Gambling Screen (SOGS) was 1%

1994 telephone survey of 1,028 MN adults: Four years later the prevalence rate was again, 1%

Gaps in our Knowledge about Problem Gambling

Is the number or proportion of pathological gamblers increasing?

What are the rates of pathological gambling among special populations?

To what extent does gambling during youth progress to problem gambling?

What are the social costs of pathological gambling on a community?

What are the effects of pathological gambling on financial problems and crime?

Is treatment effective for pathological gamblers?

What types of treatment are maximally and efficiently effective for subtypes of pathological gamblers?

What is the gap between treatment need and treatment availability, and what barriers exist to accessing treatment?

Prepared by:

Randy Stinchfield, Ph.D.

Department of Psychiatry, University of Minnesota Medical School

E-mail: stinc001@umn.edu

Minnesota Problem Gambling Helpline Statistics – Phone Calls
 State Fiscal Year 2004: July 1, 2003 – June 30, 2004

| All Calls | # |
|-----------|-------|
| Jul-03 | 346 |
| Aug-03 | 300 |
| Sep-03 | 320 |
| Oct-03 | 313 |
| Nov-03 | 248 |
| Dec-03 | 257 |
| Jan-04 | 350 |
| Feb-04 | 370 |
| Mar-04 | 384 |
| Apr-04 | 319 |
| May-04 | 408 |
| Jun-04 | 409 |
| Total | 4,024 |
| Average | 335 |

| Actual Gambling Requests | # | % |
|--------------------------|-------|------|
| Help | 692 | 42% |
| Quick Referral | 792 | 48% |
| Information | 111 | 7% |
| Other | 56 | 3% |
| Total | 1,651 | 100% |
| % of All Calls | | 41% |

NOTE: Of the 1,651 calls, the percent of those responding to these specific areas

| Percent of Helpline callers seeking help by age 7/1/03 – 6/30/04 | |
|---|------|
| < 18 | 0% |
| 18 – 21 | 5% |
| 22 – 34 | 23% |
| 35 – 50 | 40% |
| 51 – 64 | 24% |
| 65 > | 8% |
| Total | 100% |

| Sex of Gambler | |
|----------------|-----|
| Male | 47% |
| Female | 53% |

| Who is Calling | |
|----------------|-----|
| Self | 60% |
| Other | 40% |

| Location of Gambler | |
|---------------------|-----|
| Metro | 60% |
| Non-metro | 40% |

| Source used to obtain Helpline Number | |
|---------------------------------------|------|
| Phone Book | 40% |
| Professional | 10% |
| Casino | 9% |
| Previous Call | 6% |
| Internet / Other | 15% |
| Friend/Relative | 4% |
| Helpline Literature | 4% |
| Lottery/Vendor | 2% |
| Pull-tab Booth | 1% |
| TV | 6% |
| Newspaper | 2% |
| Radio | 1% |
| | 100% |

| Type of Gambling Causing the Problem | |
|--------------------------------------|------|
| Casino | 74% |
| Slots at Casino – 48% | |
| Cards at Casino – 24% | |
| Bingo at Casino – 2% | |
| Pulltabs | 11% |
| Lottery | 6% |
| Bingo non-casino | 2% |
| Sports Betting | 1% |
| Card Room | 2% |
| Horses | 1% |
| Internet | 2% |
| Other | 1% |
| | 100% |

Minnesota Problem Gambling Helpline Statistics – Web Site
 State Fiscal Year 2004: July 1, 2003 – June 30, 2004

| Overall Web Site Hits (www.miph.org/gambling) | |
|--|---------|
| Jul-03 | 11,842 |
| Aug-03 | 11,394 |
| Sep-03 | 15,347 |
| Oct-03 | 17,956 |
| Nov-03 | 23,450 |
| Dec-03 | 16,868 |
| Jan-04 | 17,348 |
| Feb-04 | 17,046 |
| Mar-04 | 24,620 |
| Apr-04 | 20,773 |
| May-04 | 20,212 |
| Jun-04 | 16,572 |
| Total | 213,428 |
| Average | 17,786 |

| Specific Web Site Hits | |
|----------------------------------|--------|
| Fee for Service Individual Pages | 19,027 |
| Fee for Service Search Page | 7,788 |
| GA/GamAnon County Display | 3,467 |
| GA/GamAnon Search Page | 6,776 |

TREATMENT RESOURCES – STATE OF MINNESOTA

107 Treatment Providers
72 GA Meetings
15 GamAnon Meetings

| | |
|-------------------|--|
| ANOKA | 3 Treatment Providers, 5 GA, 2 GamAnon |
| BECKER | 1 Treatment Provider |
| BELTRAMI | 5 Treatment Providers, 1 GA, 1 GamAnon |
| BIG STONE | 1 GA |
| BLUE EARTH | 2 Treatment Providers, 1 GA |
| BROWN | 3 Treatment Providers, 1 GA |
| CARLTON | 2 Treatment Providers, 4 GA |
| CARVER | 2 Treatment Providers |
| CHISAGO | 1 Treatment Providers, 1 GA |
| CLAY | 3 Treatment Providers |
| COOK | 1 Treatment Provider |
| COTTONWOOD | 1 Treatment Provider |
| CROW WING | 2 Treatment Providers, 1 GA |
| DAKOTA | 3 Treatment Providers, 3 GA, 2 GamAnon |
| DODGE | 1 Treatment Provider |
| DOUGLAS | 1 GA |
| FARIBAULT | 2 Treatment Providers |
| GOODHUE | 1 Treatment Provider, 1 GA |
| HENNEPIN | 26 Treatment Providers, 10 GA, 3 GamAnon |
| HUBBARD | 1 GA, 1 GamAnon |
| ITASCA | 2 Treatment Providers, 1 GA |
| KANDIYOHI | 1 Treatment Provider, 1 GA, 1 GamAnon |
| LAKE OF THE WOODS | 1 Treatment Provider |
| LYON | 1 GA |
| MAHNOMEN | 1 Treatment Provider, 1 GA, 1 GamAnon |
| MCLEOD | 1 Treatment Provider |
| MEEKER | 1 GA |
| MILLE LACS | 2 Treatment Providers, 1 GA |
| MORRISON | 1 Treatment Provider |
| NICOLLET | 1 Treatment Provider |
| NORMAN | 1 Treatment Provider |
| OLMSTED | 2 Treatment Providers, 1 GA |
| PENNINGTON | 1 GA |
| PIPESTONE | 1 Treatment Provider |
| POPE | 1 Treatment Provider |
| RAMSEY | 10 Treatment Providers, 5 GA, 1 GamAnon |
| REDWOOD | 1 GA |
| RICE | 2 Treatment Providers, 2 GA, 1 GamAnon |
| ROCK | 1 Treatment Provider |
| ROSEAU | 1 GA |

| | |
|-----------------|---------------------------------------|
| SCOTT | 1 Treatment Provider, 1 GA |
| SHERBURNE | 1 Treatment Provider |
| ST. LOUIS | 7 Treatment Providers, 7 GA |
| STEARNS | 2 Treatment Providers, 3 GA |
| STEELE | 2 Treatment Providers |
| TRAVERSE | 1 Treatment Provider |
| WABASHA | 1 Treatment Provider |
| WADENA | 1 Treatment Provider |
| WASECA | 1 Treatment Provider, 1 GA |
| WASHINGTON | 3 Treatment Providers, 1 GA |
| WINONA | 1 Treatment Provider, 1 GA |
| WRIGHT | 2 GA |
| YELLOW MEDICINE | 1 Treatment Provider, 1 GA, 1 GamAnon |

NO TREATMENT PROVIDERS

| | | |
|-----------|------------|--------|
| BIG STONE | MEEKER | WRIGHT |
| DOUGLAS | PENNINGTON | |
| HUBBARD | REDWOOD | |
| LYON | ROSEAU | |

NO GA/GAMANON

| | | |
|------------|-------------|-----------|
| BECKER | LAKE OF THE | POPE |
| CARVER | WOODS | ROCK |
| CLAY | MCLEOD | SHERBURNE |
| COOK | MORRISON | STEELE |
| COTTONWOOD | NICOLLET | TRAVERSE |
| DODGE | NORMAN | WABASHA |
| FARIBAULT | PIPESTONE | WADENA |

NO TREATMENT PROVIDERS OR GA/GAMANON

| | | |
|------------|---------------|----------|
| AITKIN | KITTSOON | PINE |
| BENTON | KOOCHICHING | POLK |
| CASS | LAC QUI PARLE | RED LAKE |
| CHIPPEWA | LAKE | RENVILLE |
| CLEARWATER | LESUEUR | SIBLEY |
| FILMORE | LINCOLN | STEVENS |
| FREEBORN | MARSHALL | SWIFT |
| GRANT | MARTIN | TODD |
| HOUSTON | MOWER | WATONWAN |
| ISANTI | MURRAY | WILKIN |
| JACKSON | NOBLES | |
| KANABEC | OTTERTAIL | |

At least 140 clients at Minnesota's six gambling addiction treatment centers have attempted suicide, according to the Minneapolis *Star Tribune*. [11]

A survey of nearly 200 Gamblers Anonymous members in Illinois found that 79% had wanted to die, 66% had contemplated suicide and 45% had a definite plan to kill themselves. [12]

The Illinois Council on Compulsive Gambling reports that more than 20 Illinois residents have killed themselves as a result of a gambling addiction since the arrival of riverboat casinos. [13]

Increased Gambling Addictions .

Gambling promoters frequently maintain that there is little, if any, relationship between the availability of gambling and gambling addiction. However, testimony from experts and data from gambling communities indicate otherwise.

The number of Gamblers Anonymous chapters in the United States has nearly doubled in the last eight years. [14]

According to Dr. Rachel Volberg, researcher who has overseen the majority of compulsive gambling prevalence surveys in the United States, gambling problems have increased noticeably in recent years as gambling has become more widely available. [15]

The percentage of Minnesota adults who demonstrated a serious gambling problem climbed 76% from 1990 (the year when Minnesota introduced its lottery) to 1994 (the year when a 17th Minnesota casino began operations). [16]

The percentage of Iowa problem and pathological gamblers rose by over 300% over the six-year period after casinos began operations. [17]

A court-ordered temporary shutdown of video lottery machines in the state of South Dakota resulted in a drastic reduction of people seeking treatment for gambling addictions. Before the machines were shut off, addiction treatment centers averaged 11 gamblers treated per month. During the shut down, the average monthly number plummeted to less than one per month. Once the machines resumed operations, the average monthly number immediately jumped to 8. [18]

The percentage of New York individuals who reported having had a gambling problem increased 74% during the decade when gambling opportunities greatly expanded. [19]

In Oregon, the number of Gamblers Anonymous chapters increased 1,000% within five years of the introduction of video poker machines. [20]

Increased Divorces

28% of Gamblers Anonymous members reported being separated or divorced as a direct result of their gambling. [21]

The National Gambling Impact Study Commission reported that it received "abundant testimony and evidence that compulsive gambling introduces a greatly heightened level of

stress and tension into marriages and families, often culminating in divorce and other manifestations of familial disharmony." [22]

A nationwide survey of divorced adults found that "2 million adults identified a spouse's gambling as a significant factor in their prior divorce." [23]

The number of divorces in Harrison County, Mississippi, which is home to ten casinos, has increased by almost 300% since the introduction of casinos. [24]

Increased Child Abuse and Neglect

The National Gambling Impact Study Commission reported: "Children of compulsive gamblers are often prone to suffer abuse, as well as neglect, as a result of parental problem or pathological gambling." [25]

In Indiana, a review of the state's gaming commission records revealed that 72 children were found abandoned on casino premises during a 14-month period. [26]

In Louisiana and South Carolina, children died after being locked in hot cars for several hours while their caretakers gambled. [27]

An Illinois mother suffocated her infant daughter in order to collect insurance money to continue gambling. [28]

Cases of child abandonment at one of the nation's largest casinos, "Foxwoods" in Ledyard, Connecticut, became so commonplace that authorities were forced to post signs in the casino's parking lots warning parents not to leave children in cars unattended. [29]

Increased Domestic Violence

According to the National Research Council, studies indicate that between 25% and 50% of spouses of compulsive gamblers have been abused. [30]

Mississippi domestic violence shelters reported increases between 100% and 300% in requests for assistance after the introduction of casinos on Mississippi's Gulf Coast. [31]

A University of Nebraska Medical Center study concluded that problem gambling is as much a risk factor for domestic violence as alcohol abuse. [32]

Domestic violence murders in at least 11 states have been traced to gambling problems since 1996. [33]

Increased Rates of Overall Crime

The crime rate in Minnesota counties with casinos increased more than 200% faster than counties without casinos. [34]

The overall number of crimes within a 30-mile radius of Atlantic City increased over 100% during the nine years following the introduction of casinos. [35]

A.U.S. News & World Report analysis found average national crime rates in casino communities to be 84% higher than communities without casinos. [36]

The number of court cases filed in Tunica County, Mississippi, increased by over 1,600% during the five-year period after casinos began operating. [37]

The annual number of police calls to the Ledyard, Connecticut, jumped over 400% within the five years after the opening of the nearby Foxwoods Casino. [38]

Nevada ranked first in crime rates among the fifty states in both 1995 and 1996, based on an analysis of FBI Uniform Crime Report statistics. [39]

University of Nevada-Las Vegas researchers concluded that the state of Wisconsin experiences an average of 5,300 additional major crimes a year due to the presence of casinos in that state. They also attributed an additional 17,100 arrests for less-serious crimes each year to the existence of casino gambling. [40]

Half of Louisiana District Attorneys surveyed in 1995 noted gambling as a factor in rising crime rates in their jurisdictions. [41]

Exploitation of the Poor

A study of 1,800 Minnesotans in state-run gambling treatment programs found that over half had yearly incomes of \$20,000 or less. The study also discovered that the amount of debt, as a proportion of income, was highest among the poorest gamblers seeking treatment. [42]

University of North Florida researchers reported: "Gambling expenditures in Las Vegas indicate a regressive pattern for gambling taxes because the percentage of household income devoted to gambling falls consistently as income rises." [43]

Half of Illinois casino gamblers with annual incomes below \$10,000 reported losing over \$1,900 to the casinos in the previous year. [44]

In New York, those living in the most impoverished areas of the state spent 800% more of their income on lottery tickets than did those living in affluent sections. [45]

An Associated Press survey of Wisconsin lottery purchases found that residents living in the poorest neighborhoods in the state spent 400% more of their income on lottery tickets than those in wealthier neighborhoods. [46]

A University of Louisville study showed that Kentuckians with annual incomes less than \$15,000 spent \$9 per week on lottery tickets, while those earning twice that amount only spent \$7. [47]

A Texas A&M study found that residents earning 2% of the state's total income, provide 10% of the state's lottery's revenue. [48]

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Northstar Alliance

The Northstar Problem Gambling Alliance, Inc.

"Attachment E"

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The Northstar Problem Gambling Alliance, Inc., a non profit organization, came into being as a result of a concern that there was not an independent entity, representing *at the same table*, the concerns of all of the stakeholders and gatekeepers in the arena of problem gambling in the State of Minnesota and this Region.

Stakeholders are defined as those who have a vested interest in gambling, including all of the gambling venues such as The Minnesota State Lottery, The Minnesota Indian Gaming Association, the independent tribal communities, Allied Charities of Minnesota, and Canterbury Park, as well as the recovering compulsive gambler, and those affected by problem gambling, such as families and friends, retail finance and banking, the judicial system, and information transfer systems.

Gatekeepers are defined as those who provide a door to recovery or other appropriate help, such as researchers who help to provide reality regarding the issue of problem gambling, school counselors, clergy, physicians and nurses, county social workers, and residential and out patient treatment providers.

Despite our sometimes conflicting missions we all share one commonality, the belief that *problem* gambling is a serious public health issue, and that it is both treatable and preventable. There is help and there is hope.

Our mission is to:

1. Increase public awareness
2. Promote the widespread availability of treatment for problem gamblers and their families, and
3. Encourage education, research and prevention.

We are emphatically *neutral* on gambling policy, though we will advocate in public forums for programs that benefit problem gamblers and those affected by problem gambling. Our mission can be summarized that we serve the problem gambler and those affected by problem gambling.

The Northstar Alliance officially began operations September 1, 2002. We cooperate with the National Council on Problem Gambling and the State of Minnesota DHS Compulsive Gambling Program. As an example of our cooperation with them we sponsored the 2003 National Problem Gambling Awareness Week Annual Conference in Minnesota held March 14, 2003.

We commend The State of Minnesota DHS Compulsive Gambling Program, other state entities, and their initiatives in the problem gambling arena, and seek continuing support and collaboration with their efforts in whatever way appropriate.

FREQUENTLY ASKED QUESTIONS ABOUT PROBLEM GAMBLING

Prepared by the Minnesota State Lottery for the North American Association of State and Provincial Lotteries (NASPL). Posters courtesy of the Minnesota Institute of Public Health.

WHAT IS PROBLEM GAMBLING?

Problem gambling refers to any gambling that goes beyond "normal" bounds of gambling for fun, recreation or entertainment. Pathological gambling is the inability, over an extended period of time, to resist impulses to gamble. It is often characterized by increasing preoccupation with gambling and a general loss of control. Pathological gamblers often "chase" their losses, feel a need to bet more frequently and in larger amounts and continue to gamble in spite of the serious negative consequences of their behavior.

ARE PATHOLOGICAL GAMBLING AND COMPULSIVE GAMBLING THE SAME THING?

Yes. Most scientists and mental health professionals prefer the term "pathological gambling", as the condition is not believed to be related to "compulsions" like excessive hand washing. The term "disordered gambling" has also been used to describe this condition.

IS SOMEONE WHO GAMBLES A LOT A COMPULSIVE GAMBLER?

Not necessarily. Many people who gamble frequently are simply people who enjoy gambling as entertainment. Generally, these people set aside a predetermined amount of money for gambling, gamble for fun rather than for the "certainty" of winning, recognize that they are likely to lose and do not bet more than they can afford to lose.

CAN YOU HAVE A GAMBLING PROBLEM WITHOUT BEING A PATHOLOGICAL GAMBLER?

Much as it is possible to abuse alcohol without being an alcoholic, it is also possible to have gambling problems without being a pathological gambler – someone can go out and lose a lot of money at a casino after being denied a promotion, for example. Often, this sort of problem resolves itself without professional intervention. Pathology is determined by both severity and frequency of the problem.

ARE THERE PHASES TO PATHOLOGICAL GAMBLING?

Dr. Robert Custer has identified three phases to pathological gambling:

- 1) The Adventurous Phase – marked by an increasing desire for gambling as excitement and often including a big win which the gambler sees as resulting from their personal abilities.
- 2) The Losing Phase – in which the gambler bets increasing amounts of money "chasing" the money they have lost.
- 3) The Desperation Phase – when gambling becomes a full-time obsession, the gambler increasingly gambles on credit and takes greater and greater risks.

These phases do not represent an inevitable progression. Most people experiencing a big win do not become pathological gamblers and some that begin to chase their losses stop before reaching the desperation phase. However, most of those seeking treatment have passed through the adventurous and losing phases and have reached desperation.

HOW CAN I TELL IF SOMEONE IS A PROBLEM GAMBLER?

Some warning signs of a gambling problem might include:

- Looking for the "high" that comes from gambling.
- Increasing isolation from family and friends.
- Declining work performance.
- Neglecting basic needs like money for food and rent.
- Pressuring others for money as financial problems crop up.
- Lying about how money is spent.
- Escaping to other excesses (alcohol, drugs, sleep).
- Denying there is a problem.

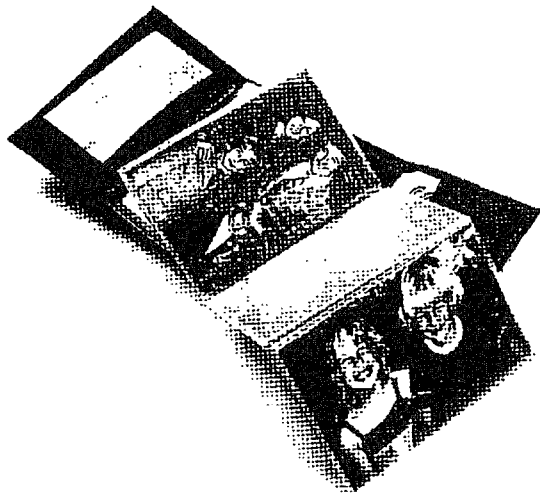
(Reprinted with permission from the Vanguard Compulsive Gambling Treatment Program in Granite Falls, Minnesota.)

In addition, Gamblers Anonymous has assembled a list of twenty questions that can help individuals determine if they might have a gambling problem. These questions should be considered as guidelines, however, and not a substitute for diagnosis by a competent therapist.

**Problem gamblers lose an average of \$25,000.
Plus whatever is in their wallets.**

If there's a problem gambler in your family, think about what they could lose. All the money. The savings. Maybe the house. Car. Job. Maybe you don't even know what they've lost already. And without help, they just might lose you too.

Minnesota Compulsive Gambling Hotline 1-800-437-3641



DO MOST GAMBLERS EVENTUALLY BECOME PROBLEM GAMBLERS?

No. For the vast majority of those who choose to gamble, it remains a harmless form of entertainment.

HOW MANY PATHOLOGICAL GAMBLERS ARE THERE?

No one knows for certain. Various methods for measuring the prevalence of gambling problems have been tried, each with their advocates and detractors. There is not agreement on the appropriate instrument to be used, on whether to consider behavior at any point in a person's life as opposed to their current condition or at what level gambling becomes a problem. A 1998 report from the Harvard Medical School attempted to synthesize all studies done on problem gambling in the United States and Canada. Their best

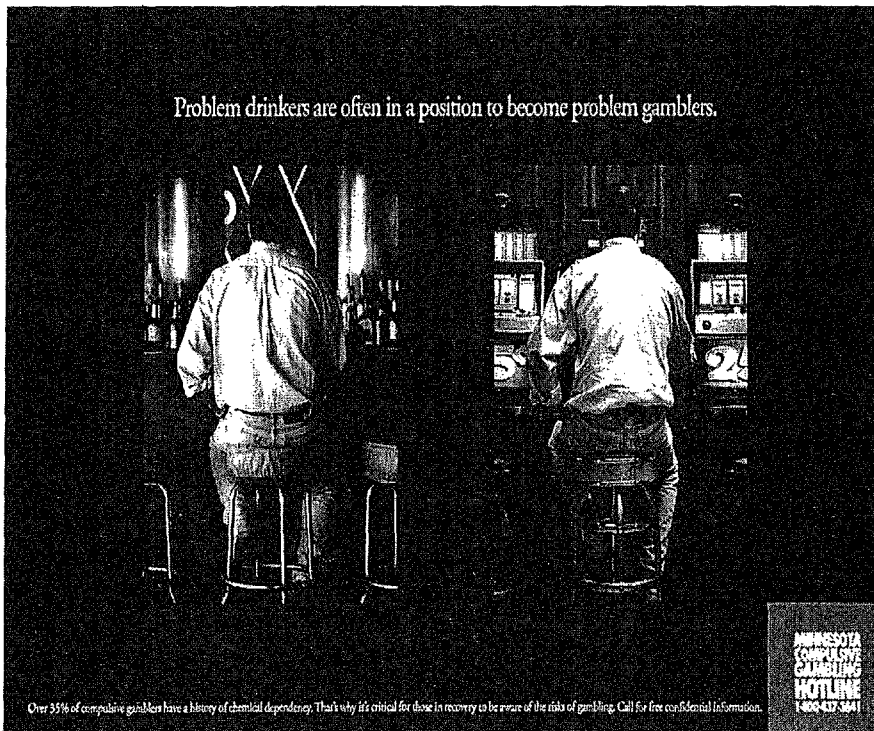
estimate was that 1.6 percent of the adults in both countries had experienced pathological gambling at some point in their life, while 1.1 percent had experienced it in the past twelve months. They further estimated that an additional 3.85 percent of adults had experienced mild to moderate problems with gambling at some point in their lives, but had not progressed to the pathological level. The National Opinion Research Center of the University of Chicago recently completed the first ever national (U.S.) survey on problem gambling prevalence. Conducted for the National Gambling Impact Study Commission, this survey used a different measurement tool than most of the studies included in the Harvard Medical School synthesis. It found that 0.9 percent of U.S. adults have met the criteria for pathological gambling at some time in their life, while 0.6 percent met the criteria in the past year. The survey also found that an additional 1.2 percent of adults had experienced moderate problems with gambling that did not reach pathological levels at some time in their life. Of these, 0.4 percent experienced these problems in the past year.

WHO BECOMES A PROBLEM GAMBLER?

Problem gamblers can be male, female, young, middle-aged, old, wealthy, poor, white or people of color. The National Opinion Research Center study described in the last section found that young adults, ethnic minorities and people with little education were slightly more likely to have serious gambling problems, but the differences were not very large.

CAN ADOLESCENTS BECOME PATHOLOGICAL GAMBLERS AS WELL?

Yes. The National Opinion Research Center study found that 1.5 percent of 16 and 17 year olds could be considered problem or pathological gamblers, or about half the rate for adults. It is not yet known, however, to what extent adolescent gambling predicts problems in an adult.



IS THERE A LINK BETWEEN PROBLEM GAMBLING AND CHEMICAL DEPENDENCY?

Yes. In several studies, approximately 50 percent of problem gamblers were found to also have drug or alcohol problems, while studies of people in treatment for substance abuse have found between 10 and 30 percent also having a gambling problem. People may have both addictions simultaneously or can switch from one addiction to another.

IS PATHOLOGICAL GAMBLING ASSOCIATED WITH OTHER MENTAL HEALTH PROBLEMS?

It appears that, in many cases, the answer is "yes". Various studies have found high rates of alcoholism, depression, anti-social personality disorder, mood disorders and other conditions in pathological gamblers, leading some researchers to suspect that problem gambling is often a symptom of an underlying condition. NASPL's compulsive gambling bibliography includes references to several studies done on this issue.

CAN PROBLEM GAMBLERS BE HELPED?

Yes. Studies have shown that treatment is effective in a great many cases. A wide range of programs exists, ranging from Gamblers Anonymous to inpatient treatment centers. There is no one program that is right for all people. If a treatment program has not worked for a particular individual, a different program may well succeed where others failed. Unfortunately, treatment programs are not equally available in all parts of North America. In the U.S., the National Council on Problem Gambling maintains a hotline (1-800-522-4700) that can help find appropriate and convenient treatment programs. The Canadian Foundation on Compulsive Gambling also maintains a helpline at 1-888-391-1111. Both numbers are available 24 hours a day, 7 days a week.

WHAT TYPES OF GAMBLING CAUSE THE MOST PROBLEM GAMBLING?

Most researchers and mental health professionals believe that different types of gambling cannot be said to "cause" problem gambling. Dr. Durand Jacobs, for example, has written: "It appears that the addict's pursuit and over indulgence in alcohol, other drugs, food, gambling, sex, overwork or whatever is NOT the addict's "problem". On the contrary, a person's addictive pattern of behavior represents that person's best SOLUTION to the stresses generated by their long-standing, underlying problems." Dr. Julian Taber has written: "Blaming alcohol or gambling for an addiction has important negative consequences. ...it allows the patient to focus on treatment and discharge plans that deal with everything except personal change." That being said, problem gamblers are attracted to different forms of gambling for different reasons. Some are attracted to the sensory stimulation of video games of chance, while others to the perception of skill in cards or sports betting. Still others are drawn to the seemingly easy money of high-risk investments. Many, if not most, pathological gamblers indulge in more than one form of gambling. However, studies of pathological gamblers have found that the most frequently cited games of preference are slot machines, card games and sports betting. A Minnesota study of 944 gamblers in treatment found that 37 percent listed slot machines as their preferred game and 37 percent listed cards. Lottery games, dice games and games of skill were each cited by less than 1 percent of those in the study. (Stinchfield and Winters, 1996)

WHAT CAUSES PROBLEM GAMBLING?

This is another area in which research is still in its preliminary stages. Different researchers have suggested a number of character traits. Dr. Richard Rosenthal, for example, has cited three components he believes necessary: (1) an intolerable feeling state such as helplessness, depression or guilt; (2) a highly developed capacity for self-deception; and (3) exposure to gambling under circumstances in which it is valued. Other researchers have suggested that physical or hereditary predispositions may play a role; these links have not been proven or disproven.

IS IT TRUE THAT 40 PERCENT OF WHITE COLLAR CRIME IS CAUSED BY PATHOLOGICAL GAMBLING?

This frequently quoted figure is attributed to a study by the "American Insurance Institute." However, there is no such study and no such institute. A recent Gaming Law Review article by Dr. Joseph Kelly discusses the origins and persistence of this particular myth.

IS THERE A RELATIONSHIP BETWEEN PATHOLOGICAL GAMBLING AND CRIME?

Undoubtedly, yes, though there is little hard information about the extent and nature of the link. Some pathological gamblers turn to crimes such as embezzlement or writing bad checks as their gambling losses mount. One Australian study showed about 36 percent of gamblers in treatment programs had committed crimes that they attributed to their gambling problem (Blaszczynski et al, 1989). However, a recent German study points out that, in many cases, the criminal behavior preceded the gambling behavior and points out that, in at least some cases, the factors predisposing one to an addiction may also predispose someone to criminal activity (Meyer, 1997). The link between pathological gambling and substance abuse and between substance abuse and criminal behavior further complicates this relationship.

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- Taber, Julian I. (1993). Addictive Behavior: An Informal Clinical View. In *Gambling Behavior and Problem Gambling*, William R. Eadington and Judy A. Cornelius, eds., pages 273-286. Reno: Institute for the Study of Gambling and Commercial Gaming, University of Nevada, Reno.

A Problem Gambling Parent in the Family?

Hey, What About Me?



A Guide to Dealing with this Hidden and Secret Problem

The DHS Compulsive Gambling Program contracted with the Minnesota Council on Compulsive Gambling (MCCG) to develop and produce this booklet. *A Problem Gambling Parent in the Family* was written by Lynn John Rambeck, Psy.D., C.A.S. and Elizabeth M. George, Director, Minnesota Council on Compulsive Gambling.

MCCG appreciates the support of the Minnesota Legislature

If you bet on...

dice games

**the
Superbowl**



Final Four



**scratch off
tickets**

**Are you just making a bet?
Or are you gambling?**

turn this over to find out...

Webster's Dictionary says:

Betting: Risking a sum of money or object of value on the outcome of a game of chance (no skill involved).

Gambling: Risking a sum of money or object of value on the outcome of a game of chance (no skill involved).

**Making a bet is gambling.
Underage gambling is illegal.**

WHERE TO LOOK FOR HELP...

If you think you know someone with a gambling problem, call the
Minnesota Problem Gambling Helpline
1-800-437-3641



North American Training Institute™
www.nati.org



Minnesota Department of Human Services
Funded by the Minnesota
Department of Human Services

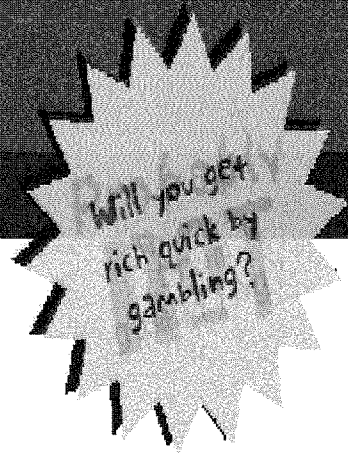


Minnesota Problem Gambling HELpline

1-800-333-HOPE

kids


parents & educators



increasing youth gambling awarene

This website was designed for the Minnesota Department of Human services by the North American Training Institute. (www.nati.org)

Questions? Contact the webmaster.




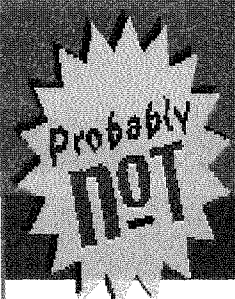
Parents & Educators

Click here to find out information you may not know about youth and gambling.

Kids

You can learn some stuff too. Click here for info you can use and a game you can play.



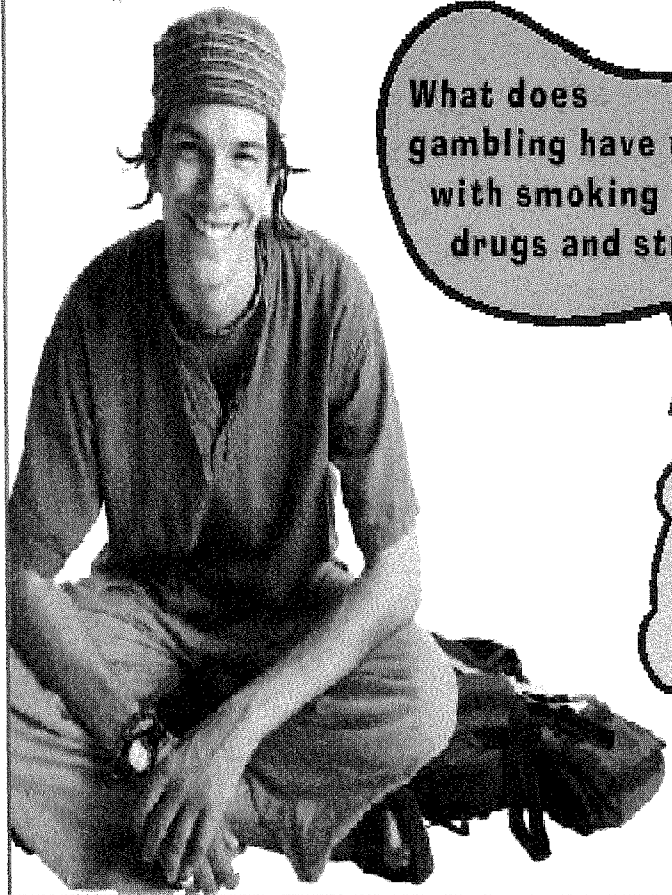


Stop Music

Is it hard for you to stop betting after you lose money?

kids

parents & educators



What does gambling have to do with smoking and drugs and stuff?

How do youth get the money to gamble?

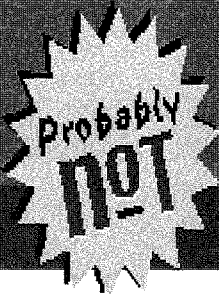
Are kids more likely to have a gambling problem?

Can gambling affect my relationships?

Is there hope for kids addicted to gambling?

Links | Downloads

Click now to play this COOL 9



[Back to the questions...](#)

Do you often daydream about gambling?

kids

parents & educators

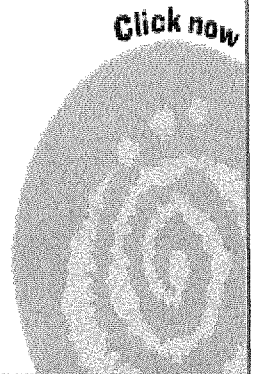


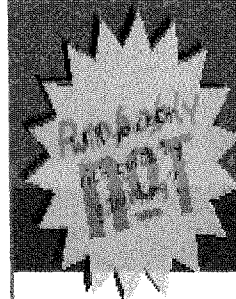
What does gambling have to do with drugs and alcohol?

[Links](#) | [Downloads](#)

Most of us learn in school about the problems that we can have with drinking and taking drugs. Hey, we are at a greater risk for developing a gambling addiction than adults...but we don't learn about gambling like we learn about drugs and alcohol.

We know, though, that youngsters may become more addicted to gambling than to alcohol, smoking or drugs...and sometimes gamble for reasons other than winning money. (APA News Release, August 6, 1998)





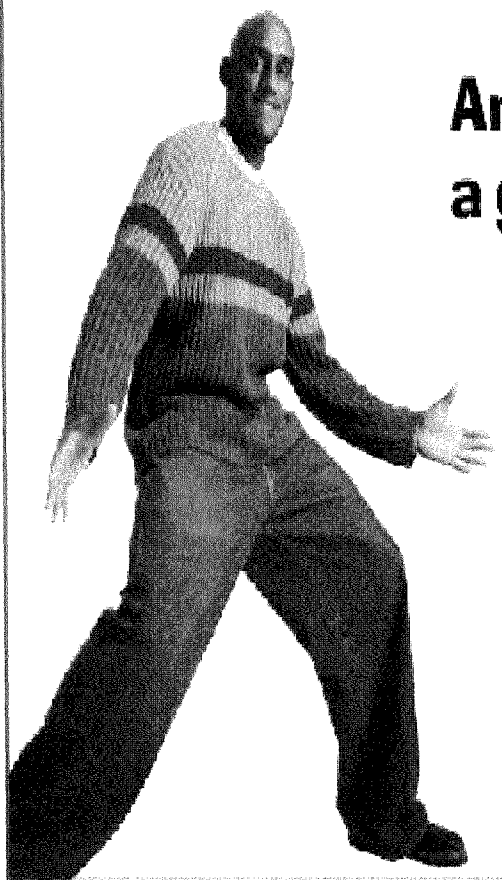
Back to the questions...

Do you often daydream about gambling?

kids

parents & educators

Links | Downloads

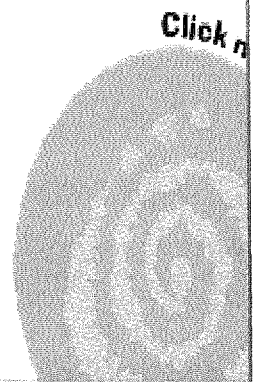


Are kids more likely to have a gambling problem?

Actually, youth have

2-3 TIMES

the likelihood of developing a gambling addiction compared to adults.



Do you often daydream about gambling?

Back to the questions...

kids

parents & educators

Where does a kid get the money to gamble?

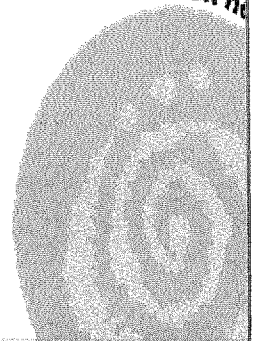
[Links](#) | [Downloads](#)

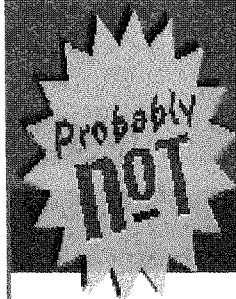
Someone with an addiction to gambling will go through all of the money they have and then ask to borrow money from parents, siblings, friends and teammates. Then, they may sell things that mean a lot to them - such as letter jackets or skis. Then, they may go on to do other really bad stuff - such as stealing - to get money to gamble.

The most popular games of chance for youth are betting on games of skill, such as pool, card games and instant scratch-off lottery tickets.



Click here





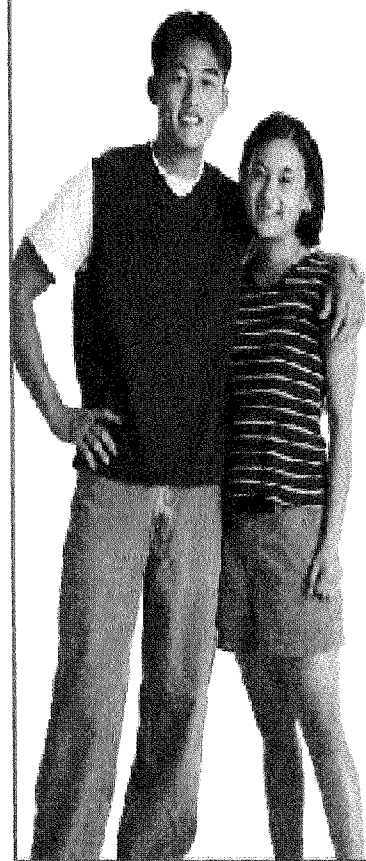
Back to the questions...

Do you often daydream about gambling?

kids

parents & educators

[Links](#) | [Downloads](#)



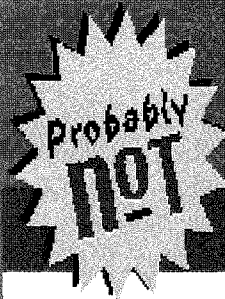
Can gambling affect my relationships?

Like an addiction to alcohol or drugs, a gambling addiction can ruin relationships with parents, sisters and brothers, girlfriends and boyfriends, coaches or teammates. Someone with an addiction to gambling puts gambling first...over family, boyfriend or girlfriend and sports teams.

(Fast Fact About Gambling, DHS, NATI, 2001)

Click here





Back to the questions...

Do you often daydream about gambling?

kids

parents & educators

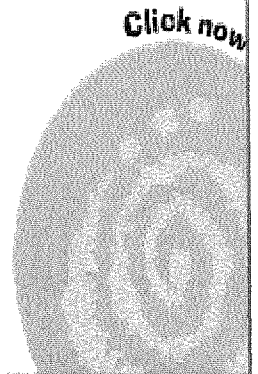
Links | Downloads



Is there any hope?


Through help and support, a person with a gambling addiction, just as a person with an addiction to drugs or alcohol, can recover and lead a great life!

Click **Here** to find out where to get help for yourself or a friend.



10 Fun things to do instead of gambling...



 [Back to the questions...](#)

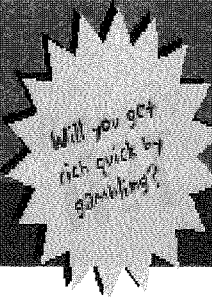
Instructions

Number of tries: 0

Number of matches: 0

Play

Again!



Back to the questions...



kids

parents & educators

Links | Downloads

Links

More Cool Sites about Youth Gambling Prevention

www.ncaa.org

More Sites with Information about Understanding Problem Gambling

www.wannbet.org

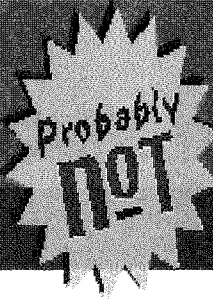
www.youthbet.net

Articles & Info About Problem Gambling

www.zoot2.com

Problem Gambling Treatment Resources in Minnesota

How to play this COOL game...



Back to the questions...

Do you often daydream about gambling?

kids

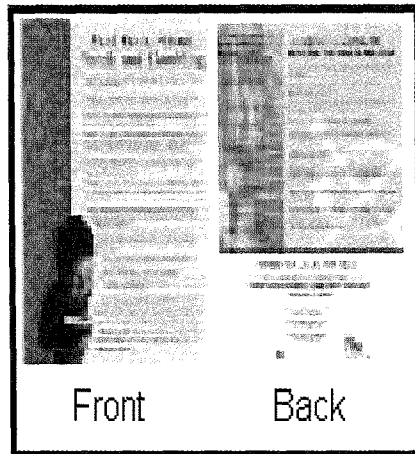
parents & educators

Click to view & print these COOL posters!

[Links](#) | [Downloads](#)

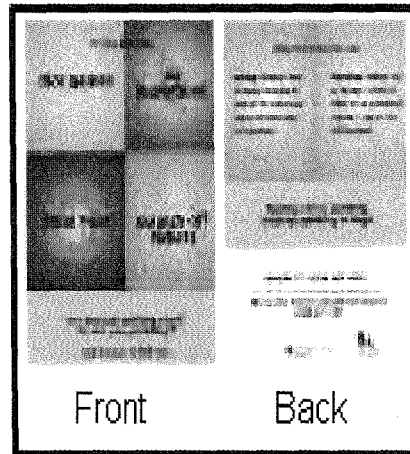
Youth Gambling Facts Sheet

Gambling vs Betting



Front

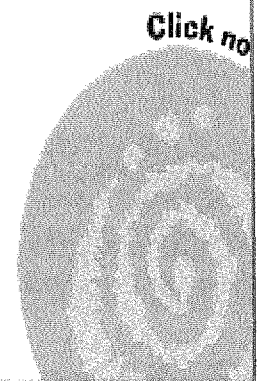
Back



Front

Back

(To download these posters: Click on the poster you would like to download. Once the poster page loads, right-click on the images, select "Save Picture As..." and choose a destination.)



Do you often daydream about gambling?

kids

parents & educators

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How much do you really know about youth gambling?



Fast Facts about Youth Gambling

Think you know someone with this problem?

The Warning Signs

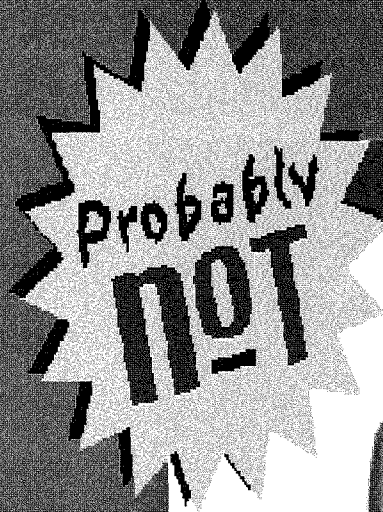
Probably **NOT**

Do you often daydream about gambling?

kids

parents & educators

Links | Downloads



Fast Facts about Youth Gambling

Prevalence rates of pathological gambling among youth are 2 to 3 times that of adults.

Between 76% and 91% of all teens will have gambled by the time they are seniors in high school.

Youth with gambling problems are at a heightened risk for suicide thoughts and attempts and are more likely to engage in illegal activities.

Today, youngsters are educated about the dangers inherent in smoking, alcohol and drug use. Few are informed about the addictive qualities associated with gambling.

[fast facts](#)

[know someone?](#)

[warning signs](#)

Do you often daydream about gambling?

kids

parents & educators

[Links](#) | [Downloads](#)

Do you think you know someone with a gambling problem? Check out these facts:

Someone with an addiction to gambling will go through all their own money and ask to borrow money from friends and family, employer, coaches or teacher.

Someone with an addiction to gambling, who no longer has money and cannot borrow any more, may steal money from parents, sister, brother and employer.

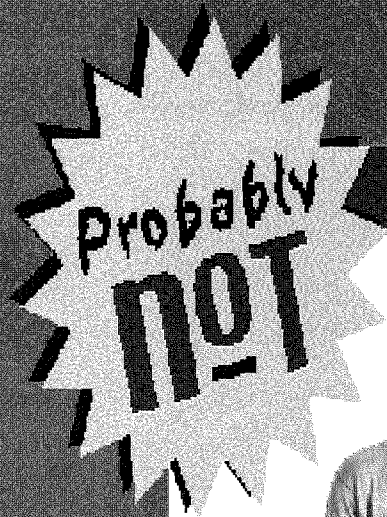
Like an addiction to drugs or alcohol, gambling can ruin relationships with parents, girl/boyfriends, coaches and friends.

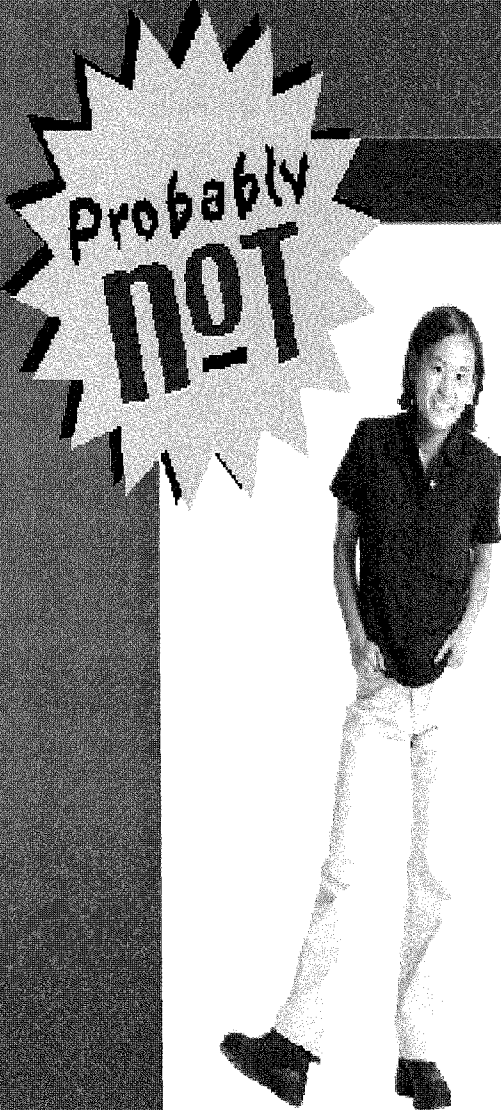
Through help and support, a person with a gambling addiction, just as a person with an addiction to drugs or alcohol, can recover and lead a great life!

[▶ fast facts](#)

[▶ know someone?](#)

[▶ warning signs](#)





Probably
NOT

[kids](#) | [parents & educators](#)

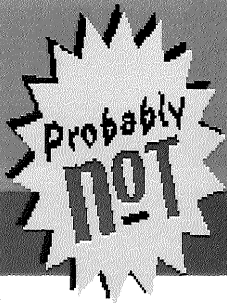
[Links](#) | [Downloads](#)

Did you know...an addiction to gambling, like alcoholism, has some warning signs.

Listed below are some questions that youngsters can ask themselves about their gambling.

- Do you think gambling is the most exciting thing you do?
- Do you often spend your free time involved in gambling activities?
- Do you try to prevent your family and friends from knowing how often you bet?
- Does thinking about gambling make it hard to do schoolwork?
- Do you often daydream about gambling?

[fast facts](#) | [know someone?](#) | [warning signs](#)



← Back to the questions...

Do you often daydream about gambling?

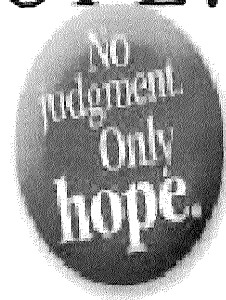
kids

parents & educators

[Links](#) | [Downloads](#)



There's Help for Problem Gamblers.
1-800-333-HOPE.



Minnesota Department of Human Services



Facts 4 You

- **Problem gambling** is an addiction.
- An **addiction** is when a person depends strongly on a drug or an activity (such as betting to win money), even though that person may be hurting him/herself or others.
- **Gambling** is risking money or something of value on an activity with an uncertain outcome.
- **Problem gambling** is a gambling behavior that causes people to use their money unwisely and make poor choices, which creates problems in the family.

For many people, gambling is an activity they do occasionally, as a way of enjoying themselves. When the game is finished, they go on to other activities that do not involve gambling. For some people, however, gambling is a problem; the act of gambling becomes more and more important and other activities turn out to be less and less interesting.



Facts 4 You

1. Problem gambling is an addiction. This addiction results in a person making poor choices that result in hurting themselves and their family. The continuing choice by your parent to gamble – despite the problems that result – may result in your parent saying hurtful things. Your parent may unfairly take out **THEIR** anger about **THEIR** problem on you or other members of your family. Your parent's anger at you – even though unjustified – often leaves you feeling as if you have done something wrong. Your parent's addiction to gambling does not make him/her a bad person.
2. Problem gambling hurts families. People are angry and may fight. Families feel extra stress and tension. Family members feel sad, afraid and embarrassed. You may get blamed when things don't go right.
3. Problem gambling causes your parent to use money unwisely. Bills may not get paid, food and clothes may not be bought, or furniture, TV's, and cars may be taken away.
4. You cannot control your parent's gambling. It is not your fault. Anything that you may have said or done **DID NOT** cause your parent's addiction. You cannot solve your parent's problems. That is not your job.



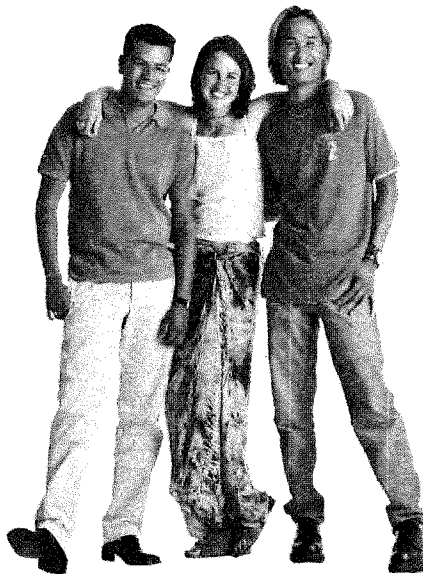
REMEMBER

You didn't **CAUSE** their problem

You can't **CURE** it...and

You can't **CONTROL** it.

Your parent is the grownup. **Your parent** needs to ask for help and **your parent** needs to work hard to get his/her life under control.





SOMETIMES I FEEL...

GUILTY – I sometimes wonder, “Did I do something to cause this problem?”

EMBARRASSED – I don’t want my friends to know how many problems we have at home. I feel ashamed of my parent’s behavior.

MAD - I feel my mom/dad should stop gambling like they promised a hundred times to do.

RESPONSIBLE – Sometimes I wonder, “If I could only think of the *right* thing to say or do, maybe he/she would stop gambling.”

CONFUSED – My life feels unpredictable. I don’t know from one minute to the next what will happen in our family.

LONELY – At times, I feel so lonely. Things have really changed and we don’t do anything as a family anymore. There is so much stress at home.

DEPRESSED – At times, I end up feeling helpless.

I also feel:

1 _____
2 _____
3 _____



What Can I DO?

It is **IMPORTANT** that you talk with someone you trust about how you are feeling. Who have you been able to talk with in the past about problems? Was it your mom or dad, teacher, or a friend's parent, a big sister or brother, aunt or uncle or grandparent? Perhaps you could speak to a school counselor or to your parent's counselor.

The purpose of sharing information is to receive helpful feedback. The discussion should remain confidential unless you are in a situation of possible harm or have been harmed by another.

Now that you have identified someone you can talk to, it is important to share how this problem is bothering **YOU**.

- TALK** about how you feel, your fears, and your anger. What is going on with you? You may not want to believe your parent actually has a problem. You may even feel embarrassed or ashamed. When you talk to someone you trust about a problem in your family, you will feel less alone and more hopeful.
- REMEMBER** fear and anger are normal when you live with a parent who is addicted to gambling. Their behavior is confusing. Why would anyone create a problem that hurts the people they love? That's a gambling addiction! You can hate what is going on in your family, while at the same time love your parent.
- Are you afraid of what your parent will say or do if you talk about the gambling problem? What do you think will happen? Do you need some help to learn how to communicate with your parent about the problem gambling?
- Make a list of the things that have changed in your life because of the gambling problem in your family. Your examples may include:
 - How you feel? _____
 - How you think? _____
 - How you have started to act differently?



HOW TO STAY HAPPY

- ◆ Recognize that there are problems in your family, **BUT** also realize that some things are working right and certain things still bring you happiness. Don't allow yourself to get too discouraged about life itself.

- ◆ When do you feel the most confident?

- Ⓒ In school
- Ⓒ At home
- Ⓒ Playing sports

- ◆ It is **IMPORTANT** to have **FUN**. Learn to have fun and accomplish things even though there are problems.

- ◆ I have fun when I...

- ◆ It is **IMPORTANT** to focus on positive goals such as:

- ◆ Maintaining good grades at school
- ◆ Developing and maintaining new friendships
- ◆ Staying involved in:
 - Ⓒ Sports
 - Ⓒ Girl Scouts/Boy Scouts
 - Ⓒ Choir & music
 - Ⓒ School activities
- ◆ Learning a new skill, such as:
 - Ⓒ Rollerblading
 - Ⓒ Juggling
 - Ⓒ Drawing or Painting



These activities provide enjoyment **AND** relief from the stress at home.

- ◆ Despite the worries you have today about your parent's gambling, it is **IMPORTANT** to appreciate the good things that you have going for you.

Kid's page

I Feel _____



A. What's better than a talking dog?

B. What kind of dog tells time?

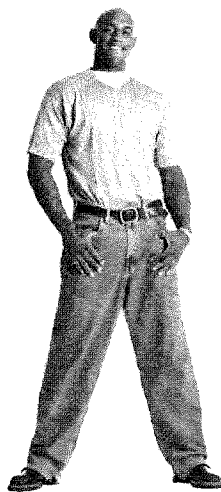
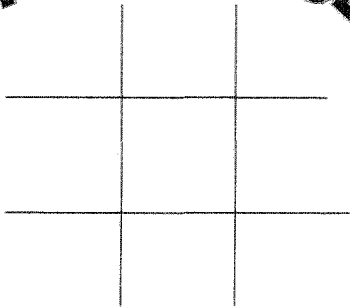
Some of my hobbies are:

1. _____
2. _____
3. _____

My Favorite Song is _____

C. How do you know if there is an elephant under the bed?

TIC TAC TOE



Draw a picture

A. A Spelling Bee B. A Watch Dog C. Your nose is touching the ceiling

PLACES TO CALL OR ---TO GET MORE INFORMATION
There's Help in Minnesota for You and the Problem
Gambler
1-800-333-HOPE

Information for kids on the Internet:

www.probablynot.net: A site for youth from the Minnesota Department of Human Services.

www.wannabet.org: A cool site for kids concerned about gambling by the North American Training Institute. www.nati.org or info@nati.org

www.youthbet.net: Interactive site for youth from Ontario, including games, quizzes, and information.

For Help:

www.gamblersanonymous.org: National Office for Gamblers Anonymous.

www.gam-anon.org: National Office for Gam-Anon, a twelve-step program for families/friends of problem gamblers.

ncpgambling.org: The mission of NCPG is to increase public awareness, ensure treatment, and encourage health.

Acknowledgements

The Minnesota Department of Human Services (DHS) identified a need to create a product for children, ages 10 to 12, of gamblers that could be used by treatment providers to open a discussion about parental problem gambling as a family issue.

The objective was to create a product that allows children to build on what they already know about other addictions and to have treatment providers use that product in working with the families of gamblers. Access to other information appropriate for this age group can be found on the website www.probablynot.net.

The DHS Compulsive Gambling Program contracted with the North American Training Institute to develop and produce this booklet. *It's Not About Me* was written by Lynn John Rambeck, Psy.D., C.A.S., Minneapolis, MN and Elizabeth M. George, Director, North American Training Institute, Duluth, MN.

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Originating Office

Minnesota Department of Human Services, Compulsive Gambling Program, 444 Lafayette Road, St. Paul, MN 55155-3828

The photographs in this publication are from professional stock portfolios and do not represent individuals associated with the problem of gambling described within.

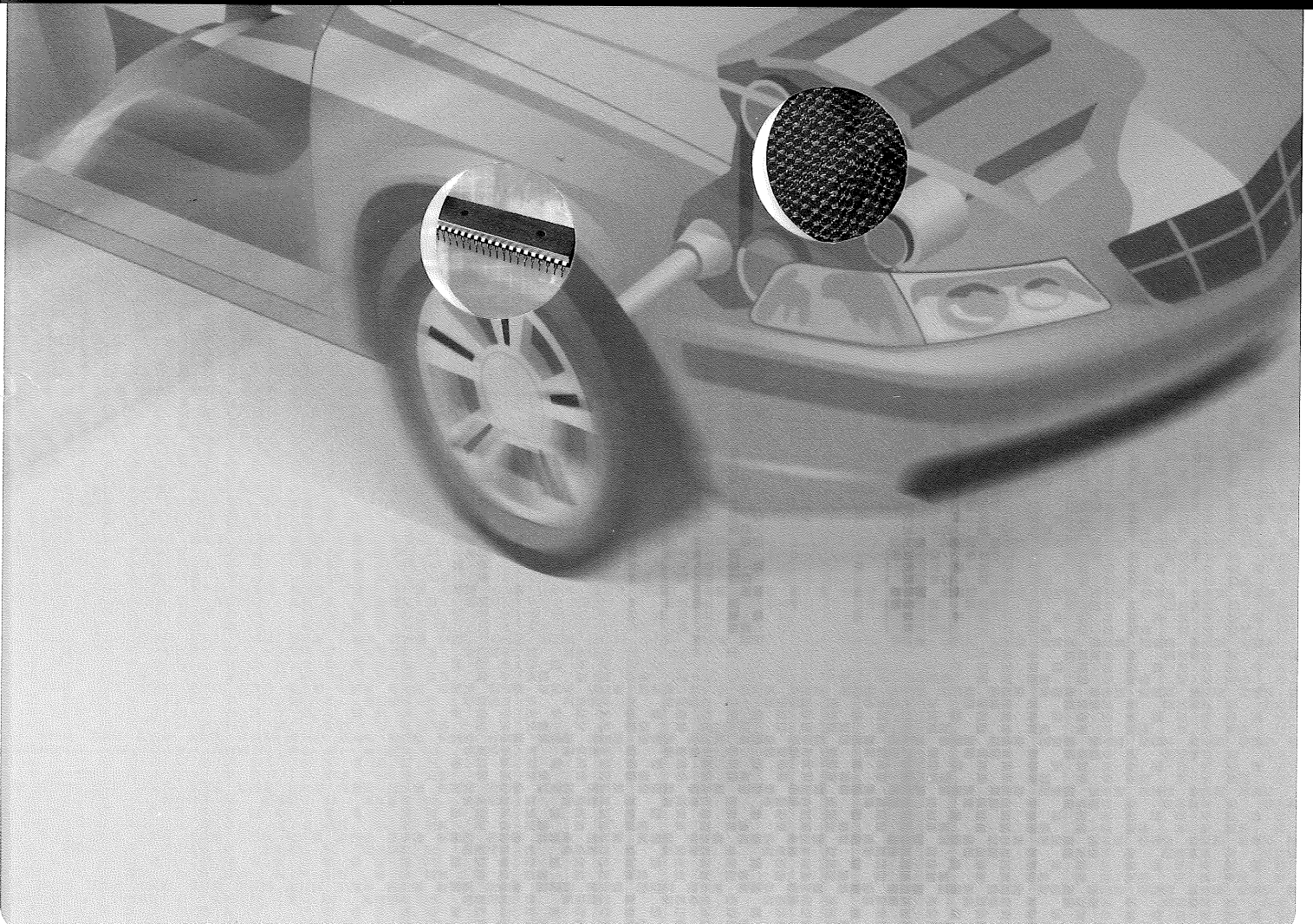


Minnesota Department of Human Services

Minnesota Problem Gambling Helpline
1-800-333-HOPE

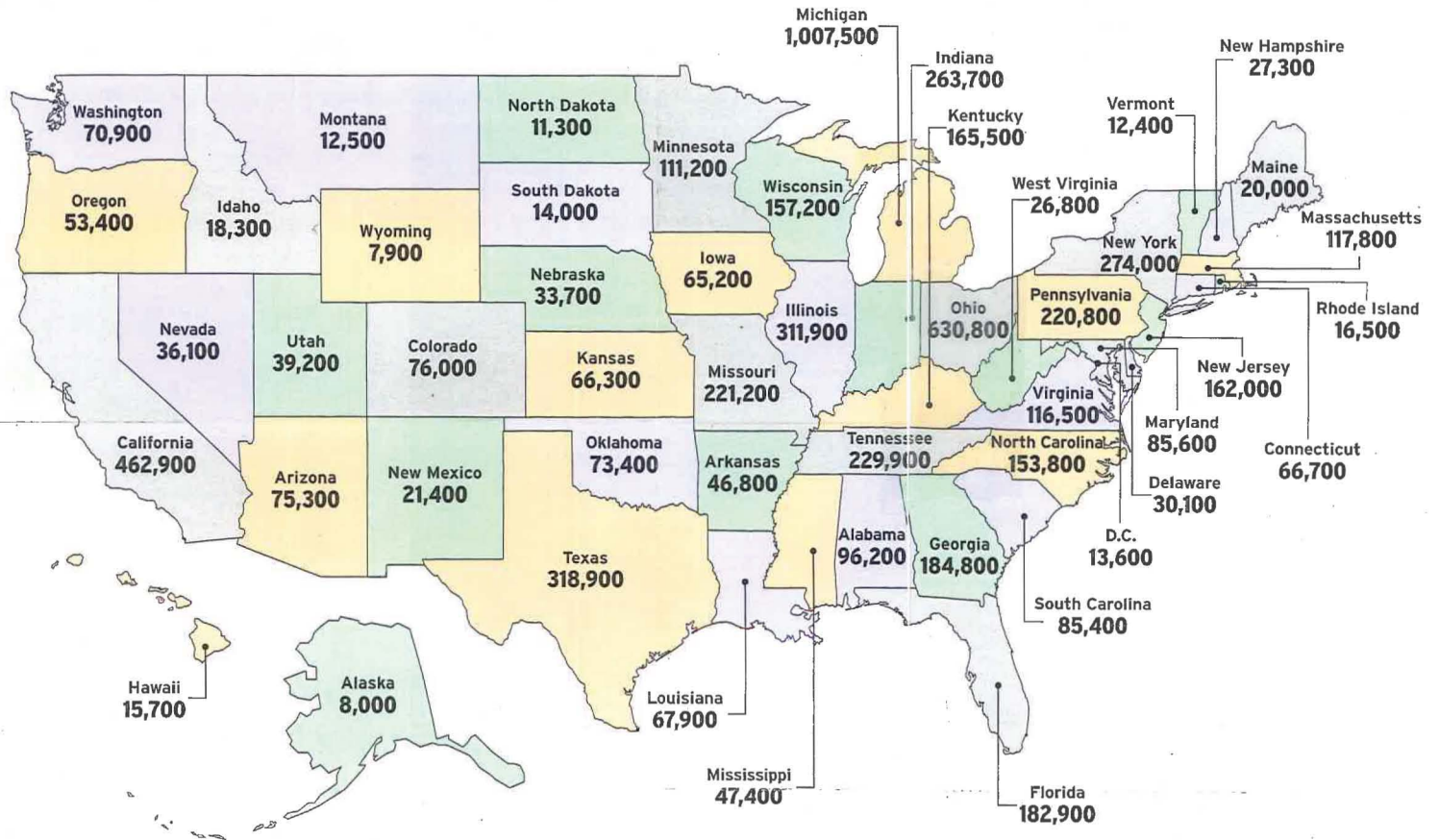


The Auto Industry's *economic* story.





America's Automobile Industry
DRIVING the Economy In All 50 States



U.S. Auto Industry Employment
Direct and Spin-off Jobs

The automobile industry is one of the largest industries in the nation. It creates 6.6 million direct and spin-off jobs and produces \$243 billion in payroll compensation.

The impact is clear—America's auto industry is the engine that drives the economy.

To learn more about how the auto industry is building the U.S. economy, visit www.autoalliance.org

Source: The Center for Automotive Research

Jobs, Jobs, Jobs

America's automobile industry is an engine of job creation, producing a total of 6.6 million jobs in all 50 states.

Approximately 1.3 million Americans are employed directly by the automobile industry. Another 2.2 million U.S. workers are employed indirectly by auto industry suppliers and other industry-related companies. Expenditures of auto industry employees create an additional 3.1 million jobs nationwide.

For each state, the listing below provides information on:

- total jobs dependent on the U.S. auto industry
- workers directly employed by auto companies (manufacturers and dealerships)
- jobs indirectly related to sales and production of new light vehicles in the U.S.
- jobs created by expenditures of employees directly or indirectly working in the auto industry
- personal income

See how the auto industry is building your state's economy:

ALABAMA

- 96,200 total jobs dependent on the auto industry
- 19,500 workers directly employed by auto companies
- 33,800 jobs indirectly related to sales/production
- 42,900 jobs created by expenditures of auto industry employees
- \$3 billion in personal income

ALASKA

- 8,000 total jobs dependent on the auto industry
- 1,400 workers directly employed by auto companies
- 2,000 jobs indirectly related to sales/production
- 4,600 jobs created by expenditures of auto industry employees
- \$270 million in personal income

ARIZONA

- 75,300 total jobs dependent on the auto industry
- 16,000 workers directly employed by auto companies
- 21,219 jobs indirectly related to sales/production
- 38,100 jobs created by expenditures of auto industry employees
- \$2.4 billion in personal income

ARKANSAS

- 46,800 total jobs dependent on the auto industry
- 6,000 workers directly employed by auto companies
- 18,500 jobs indirectly related to sales/production
- 22,300 jobs created by expenditures of auto industry employees
- \$1.3 billion in personal income

CALIFORNIA

- 462,900 total jobs dependent on the auto industry
- 98,700 workers directly employed by auto companies
- 118,400 jobs indirectly related to sales/production
- 245,800 jobs created by expenditures of auto industry employees
- \$17.8 billion in personal income

COLORADO

- 76,000 total jobs dependent on the auto industry
- 12,800 workers directly employed by auto companies
- 20,500 jobs indirectly related to sales/production
- 42,700 jobs created by expenditures of auto industry employees
- \$2.5 billion in personal income

CONNECTICUT

- 66,700 total jobs dependent on the auto industry
- 9,900 workers directly employed by auto companies
- 22,000 jobs indirectly related to sales/production
- 34,800 jobs created by expenditures of auto industry employees
- \$2.9 billion in personal income

DELAWARE

- 30,100 total jobs dependent on the auto industry
- 8,500 workers directly employed by auto companies
- 9,900 jobs indirectly related to sales/production
- 11,700 jobs created by expenditures of auto industry employees
- \$1.3 billion in personal income

DISTRICT OF COLUMBIA

- 13,600 total jobs dependent on the auto industry
- 300 workers directly employed by auto companies
- 3,900 jobs indirectly related to sales/production
- 9,400 jobs created by expenditures of auto industry employees
- \$690 million in personal income

FLORIDA

- 182,900 total jobs dependent on the auto industry
- 45,400 workers directly employed by auto companies
- 47,300 jobs indirectly related to sales/production
- 90,200 jobs created by expenditures of auto industry employees
- \$5.7 billion in personal income

GEORGIA

- 184,800 total jobs dependent on the auto industry
- 31,200 workers directly employed by auto companies
- 64,400 jobs indirectly related to sales/production
- 89,200 jobs created by expenditures of auto industry employees
- \$6.4 billion in personal income

HAWAII

- 15,700 total jobs dependent on the auto industry
- 2,300 workers directly employed by auto companies
- 3,700 jobs indirectly related to sales/production
- 9,700 jobs created by expenditures of auto industry employees
- \$480 million in personal income

ILLINOIS

- 18,300 total jobs dependent on the auto industry
- 3,300 workers directly employed by auto companies
- 5,400 jobs indirectly related to sales/production
- 9,600 jobs created by expenditures of auto industry employees
- \$500 million in personal income

INDIANA

- 311,900 total jobs dependent on the auto industry
- 45,400 workers directly employed by auto companies
- 114,900 jobs indirectly related to sales/production
- 151,600 jobs created by expenditures of auto industry employees
- \$12.1 billion in personal income

INDIANA

- 263,700 total jobs dependent on the auto industry
- 61,100 workers directly employed by auto companies
- 91,100 jobs indirectly related to sales/production
- 118,500 jobs created by expenditures of auto industry employees
- \$8.9 billion in personal income

IOWA

- 65,200 total jobs dependent on the auto industry
- 10,100 workers directly employed by auto companies
- 23,200 jobs indirectly related to sales/production
- 31,900 jobs created by expenditures of auto industry employees
- \$1.9 billion in personal income

KANSAS

- 66,300 total jobs dependent on the auto industry
- 12,400 workers directly employed by auto companies
- 21,800 jobs indirectly related to sales/production
- 32,100 jobs created by expenditures of auto industry employees
- \$2.1 billion in personal income

KENTUCKY

- 165,500 total jobs dependent on the auto industry
- 28,100 workers directly employed by auto companies
- 72,600 jobs indirectly related to sales/production
- 64,800 jobs created by expenditures of auto industry employees
- \$5.5 billion in personal income

LOUISIANA

- 67,900 total jobs dependent on the auto industry
- 15,500 workers directly employed by auto companies
- 19,100 jobs indirectly related to sales/production
- 33,300 jobs created by expenditures of auto industry employees
- \$2.2 billion in personal income

MAINE

- 17,700 total jobs dependent on the auto industry
- 3,300 workers directly employed by auto companies
- 6,000 jobs indirectly related to sales/production
- 10,700 jobs created by expenditures of auto industry employees
- \$530 million in personal income

MARYLAND

- 85,600 total jobs dependent on the auto industry
- 19,400 workers directly employed by auto companies
- 26,900 jobs indirectly related to sales/production
- 39,300 jobs created by expenditures of auto industry employees
- \$3 billion in personal income

MASSACHUSETTS

- 117,800 total jobs dependent on the auto industry
- 16,900 workers directly employed by auto companies
- 35,300 jobs indirectly related to sales/production
- 65,600 jobs created by expenditures of auto industry employees
- \$4.6 billion in personal income

MICHIGAN

- 1,007,500 total jobs dependent on the auto industry
- 289,300 workers directly employed by auto companies
- 296,100 jobs indirectly related to sales/production
- 422,100 jobs created by expenditures of auto industry employees
- \$44.7 billion in personal income

MINNESOTA

- 111,200 total jobs dependent on the auto industry
- 17,450 workers directly employed by auto companies
- 36,550 jobs indirectly related to sales/production
- 57,200 jobs created by expenditures of auto industry employees
- \$3.8 billion in personal income

MISSISSIPPI

- 47,400 total jobs dependent on the auto industry
- 8,800 workers directly employed by auto companies
- 15,400 jobs indirectly related to sales/production
- 23,000 jobs created by expenditures of auto industry employees
- \$1.3 billion in personal income

MISSOURI

- 221,200 total jobs dependent on the auto industry
- 36,200 workers directly employed by auto companies
- 91,200 jobs indirectly related to sales/production
- 73,000 jobs created by expenditures of auto industry employees
- \$7.6 billion in personal income

MONTANA

- 12,500 total jobs dependent on the auto industry
- 2,500 workers directly employed by auto companies
- 3,400 jobs indirectly related to sales/production
- 6,600 jobs created by expenditures of auto industry employees
- \$300 million in personal income

NEBRASKA

- 33,700 total jobs dependent on the auto industry
- 5,300 workers directly employed by auto companies
- 11,100 jobs indirectly related to sales/production
- 17,300 jobs created by expenditures of auto industry employees
- \$1 billion in personal income

NEVADA

- 36,100 total jobs dependent on the auto industry
- 5,500 workers directly employed by auto companies
- 9,200 jobs indirectly related to sales/production
- 21,400 jobs created by expenditures of auto industry employees
- \$1.2 billion in personal income

NEW HAMPSHIRE

- 27,300 total jobs dependent on the auto industry
- 4,400 workers directly employed by auto companies
- 9,100 jobs indirectly related to sales/production
- 13,800 jobs created by expenditures of auto industry employees
- \$900 million in personal income

NEW JERSEY

- 162,000 total jobs dependent on the auto industry
- 32,000 workers directly employed by auto companies
- 53,200 jobs indirectly related to sales/production
- 76,800 jobs created by expenditures of auto industry employees
- \$7 billion in personal income

NEW MEXICO

- 21,400 total jobs dependent on the auto industry
- 4,600 workers directly employed by auto companies
- 5,600 jobs indirectly related to sales/production
- 11,200 jobs created by expenditures of auto industry employees
- \$580 million in personal income

NEW YORK

- 274,000 total jobs dependent on the auto industry
- 53,600 workers directly employed by auto companies
- 73,500 jobs indirectly related to sales/production
- 146,900 jobs created by expenditures of auto industry employees
- \$12.3 billion in personal income

NORTH CAROLINA

- 153,000 total jobs dependent on the auto industry
- 24,500 workers directly employed by auto companies
- 54,300 jobs indirectly related to sales/production
- 75,000 jobs created by expenditures of auto industry employees
- \$4.8 billion in personal income

NORTH DAKOTA

- 12,500 total jobs dependent on the auto industry
- 2,300 workers directly employed by auto companies
- 3,400 jobs indirectly related to sales/production
- 5,600 jobs created by expenditures of auto industry employees
- \$280 million in personal income

OHIO

- 630,800 total jobs dependent on the auto industry
- 131,600 workers directly employed by auto companies
- 234,500 jobs indirectly related to sales/production
- 264,700 jobs created by expenditures of auto industry employees
- \$22.6 billion in personal income

OKLAHOMA

- 73,400 total jobs dependent on the auto industry
- 13,300 workers directly employed by auto companies
- 26,800 jobs indirectly related to sales/production
- 33,300 jobs created by expenditures of auto industry employees
- \$2.2 billion in personal income

OREGON

- 53,400 total jobs dependent on the auto industry
- 10,500 workers directly employed by auto companies
- 15,700 jobs indirectly related to sales/production
- 27,200 jobs created by expenditures of auto industry employees
- \$1.7 billion in personal income

PENNSYLVANIA

- 220,800 total jobs dependent on the auto industry
- 39,700 workers directly employed by auto companies
- 72,300 jobs indirectly related to sales/production
- 108,800 jobs created by expenditures of auto industry employees
- \$7.7 billion in personal income

RHODE ISLAND

- 16,500 total jobs dependent on the auto industry
- 2,100 workers directly employed by auto companies
- 5,900 jobs indirectly related to sales/production
- 8,500 jobs created by expenditures of auto industry employees
- \$520 million in personal income

SOUTH CAROLINA

- 85,400 total jobs dependent on the auto industry
- 11,850 workers directly employed by auto companies
- 33,850 jobs indirectly related to sales/production
- 39,700 jobs created by expenditures of auto industry employees
- \$2.6 billion in personal income

SOUTH DAKOTA

- 14,000 total jobs dependent on the auto industry
- 2,300 workers directly employed by auto companies
- 4,400 jobs indirectly related to sales/production
- 7,300 jobs created by expenditures of auto industry employees
- \$350 million in personal income

TENNESSEE

- 229,900 total jobs dependent on the auto industry
- 32,600 workers directly employed by auto companies
- 95,900 jobs indirectly related to sales/production
- 101,400 jobs created by expenditures of auto industry employees
- \$7.9 billion in personal income

TEXAS

- 318,900 total jobs dependent on the auto industry
- 62,900 workers directly employed by auto companies
- 85,800 jobs indirectly related to sales/production
- 170,200 jobs created by expenditures of auto industry employees
- \$11.5 billion in personal income

UTAH

- 39,200 total jobs dependent on the auto industry
- 5,900 workers directly employed by auto companies
- 12,300 jobs indirectly related to sales/production
- 21,000 jobs created by expenditures of auto industry employees
- \$1.1 billion in personal income

VERMONT

- 12,400 total jobs dependent on the auto industry
- 1,800 workers directly employed by auto companies
- 4,100 jobs indirectly related to sales/production
- 6,500 jobs created by expenditures of auto industry employees
- \$330 million in personal income

VIRGINIA

- 116,500 total jobs dependent on the auto industry
- 22,600 workers directly employed by auto companies
- 38,900 jobs indirectly related to sales/production
- 55,000 jobs created by expenditures of auto industry employees
- \$4 billion in personal income

WASHINGTON

- 70,900 total jobs dependent on the auto industry
- 14,600 workers directly employed by auto companies
- 18,800 jobs indirectly related to sales/production
- 37,500 jobs created by expenditures of auto industry employees
- \$2.5 billion in personal income

WEST VIRGINIA

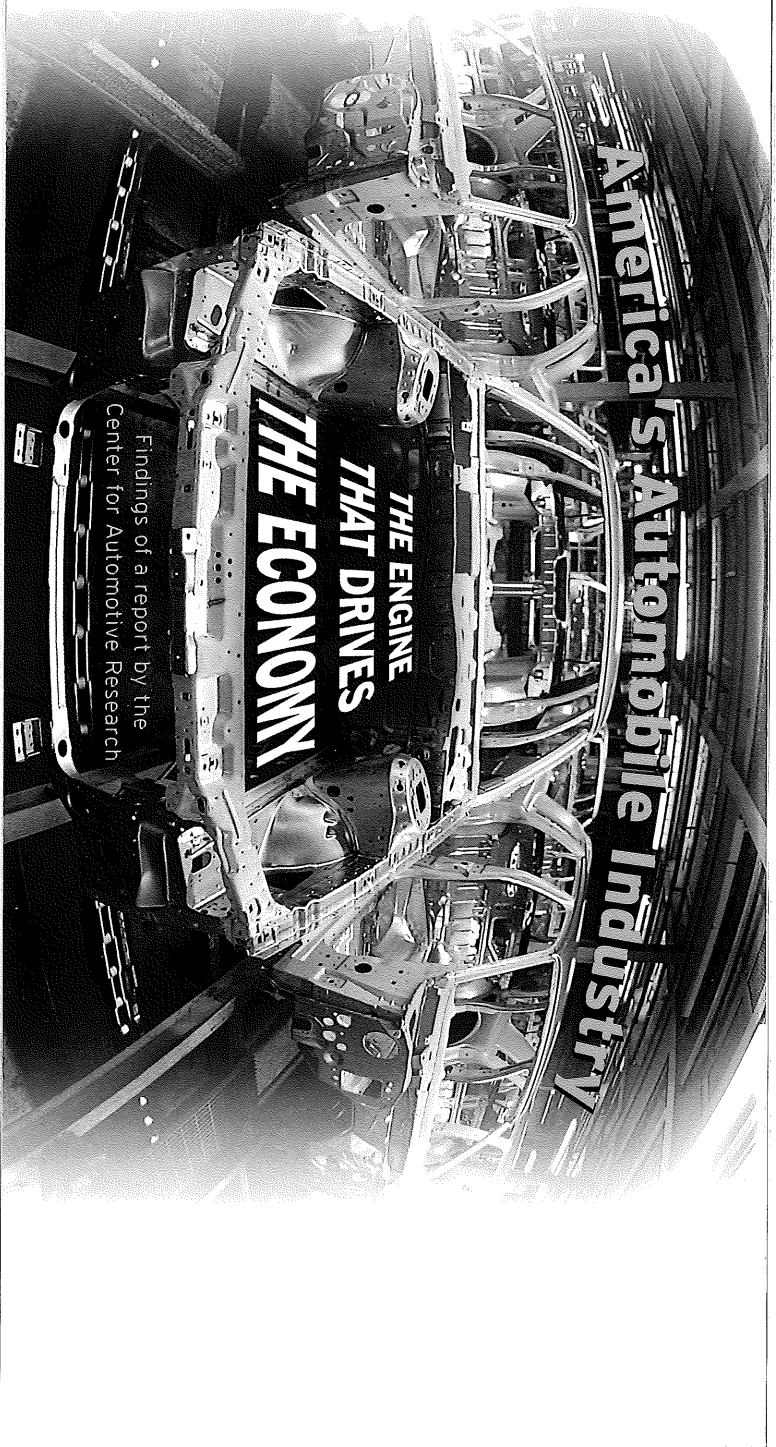
- 26,800 total jobs dependent on the auto industry
- 5,900 workers directly employed by auto companies
- 8,800 jobs indirectly related to sales/production
- 12,100 jobs created by expenditures of auto industry employees
- \$780 million in personal income

WISCONSIN

- 157,200 total jobs dependent on the auto industry
- 25,500 workers directly employed by auto companies
- 58,000 jobs indirectly related to sales/production
- 73,700 jobs created by expenditures of auto industry employees
- \$5.1 billion in personal income

WYOMING

- 13,900 total jobs dependent on the auto industry
- 1,400 workers directly employed by auto companies
- 2,200 jobs indirectly related to sales/production
- 4,300 jobs created by expenditures of auto industry employees
- \$220 million in personal income



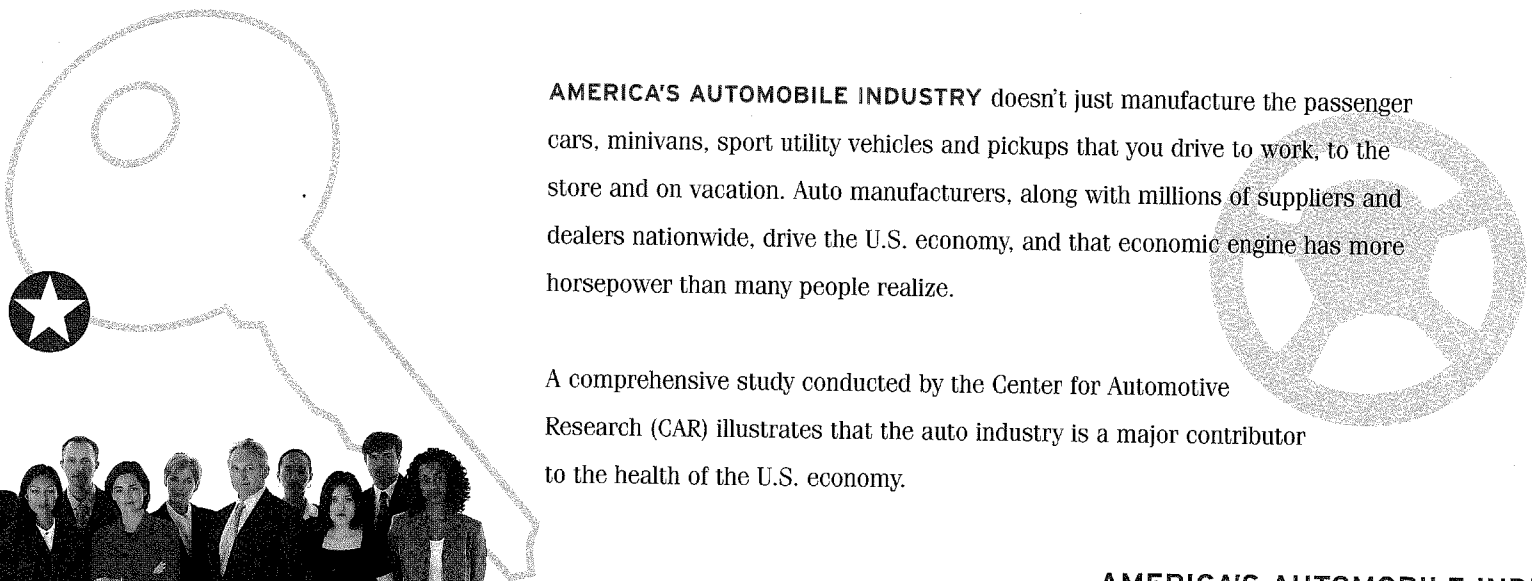
America's Automobile Industry

THE ENGINE
THAT DRIVES
THE ECONOMY

Findings of a report by the
Center for Automotive Research



Alliance of Automobile Manufacturers



AMERICA'S AUTOMOBILE INDUSTRY doesn't just manufacture the passenger cars, minivans, sport utility vehicles and pickups that you drive to work, to the store and on vacation. Auto manufacturers, along with millions of suppliers and dealers nationwide, drive the U.S. economy, and that economic engine has more horsepower than many people realize.

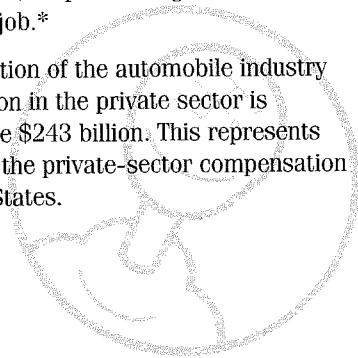
A comprehensive study conducted by the Center for Automotive Research (CAR) illustrates that the auto industry is a major contributor to the health of the U.S. economy.



AMERICA'S AUTOMOBILE INDUSTRY
THE ENGINE THAT DRIVES
THE ECONOMY

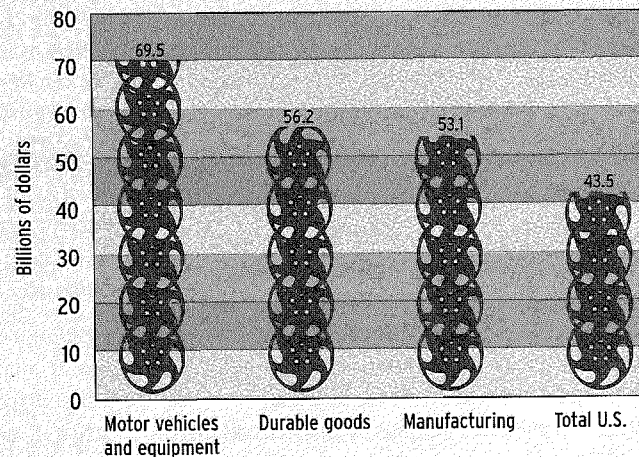
COMPENSATION PAID TO EMPLOYEES in the auto industry ranks among the highest nationwide.

- Indeed, auto industry salaries averaged \$69,500 in 2001, 60 percent higher than the averaged U.S. job.*
- The contribution of the automobile industry to compensation in the private sector is estimated to be \$243 billion. This represents 5.6 percent of the private-sector compensation in the United States.



2001 COMPENSATION FOR EMPLOYEES IN U.S. SECTORS*

Average compensation received by auto industry employees in 2001 was \$69,500. This is considerably higher than average compensation received by employees in all durable goods manufacturing (\$56,200), in total U.S. manufacturing (\$53,100) and in total U.S. jobs (\$43,500).



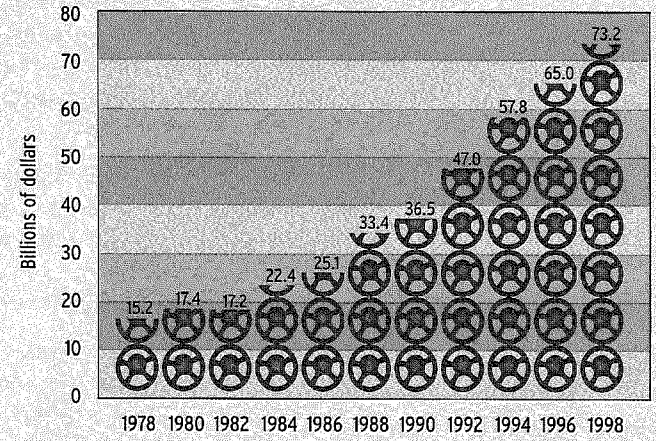
COMPENSATION

MANY ECONOMISTS do not rank the significance of an industry by its size or resources alone. Instead, economists look at many key indicators. The indicators below show the economic contributions of the auto industry.

- The U.S. automobile industry produces a higher level of output than any other single industry. When measured in constant 1996 dollars, automobile economic output increased by 51 percent during 1987–2002.*
- More than 3.3 percent of America's total gross domestic product (GDP) is generated by the sale and production of new light vehicles.*

U.S. EXPORTS OF MOTOR VEHICLES AND PARTS, 1978-1999

U.S. exports of vehicles and component parts rose from \$33.4 billion in 1988 to a record \$74 billion in 1997, an increase of 122 percent.



KEY ECONOMIC INDICATORS

- During the 1990s, the auto industry has substantially outpaced the overall U.S. economy. Since 1992, the auto industry has averaged 6.3 percent growth per year, while U.S. Gross Domestic Product (USGDP) has averaged 5.5 percent growth

- The auto industry has contributed to lower rates of price inflation in the U.S. economy. Since 1978, the annual U.S. inflation rate (4.8 percent) has been more than a third higher than for new vehicles (3.1 percent).

- The national rate of unemployment is considered a strong indicator of economic vitality. In 2002, while the national unemployment rate was at 5.8 percent, the unemployment rate for the auto industry was 5.4 percent.*

- The automobile industry has contributed to the nation's exports. During 1989–1998, exports of light-duty vehicles increased 37 percent, from 970,000 units to 1.33 million vehicles. In 1998, auto exports represented 12 percent of total U.S. exports of non-agricultural products.

- Economists can measure the productivity of an industry through calculating the “value added per employee,” or the actual value produced by an employee. In 2000, motor vehicle manufacturing ranked third in terms of value added per employee. The auto industry's level of \$292,000 per worker was 143 percent higher than U.S. manufacturing's average of \$120,000.*



OUTPACING THE U.S. ECONOMY

AUTO MANUFACTURERS REQUIRE ENORMOUS AMOUNTS OF SUPPLIES to produce motor vehicles. By using so many products made by America's major supplying businesses, the auto industry drives up employment across the United States.

- For every worker directly employed by an auto-maker, nearly seven spin-off jobs are created.
- America's automakers are among the largest purchasers of aluminum, copper, iron, lead, plastics, rubber, textiles, vinyl, steel and computer chips.

- Within durable manufacturing, major auto suppliers are producers of fabricated metals (such as automobile stampings), machinery and computers, electrical equipment (such as semi-conductors and batteries) and primary metals (such as steel mills and foundries).

- Within non-durable manufacturing, key suppliers are makers of plastics (such as exterior and interior trim) and apparel (such as interior fabric).



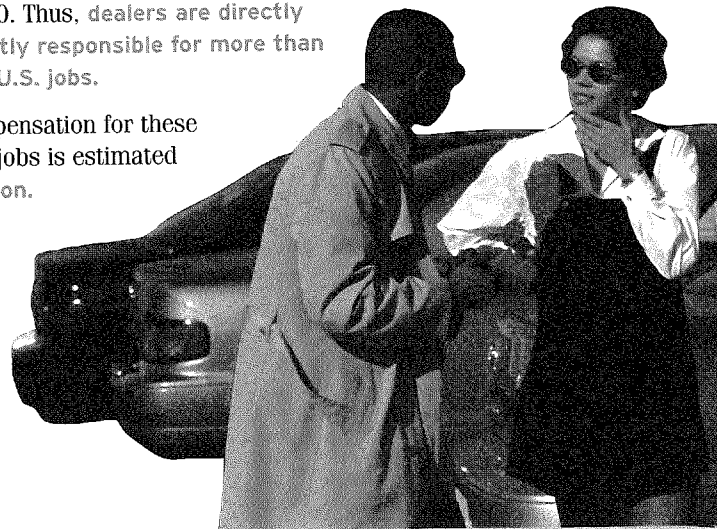
DRIVING AMERICA'S BUSINESS

DEALERS CONTRIBUTE SIGNIFICANTLY TO THE ECONOMY. Motor vehicle manufacturers and distributors are in a partnership with dealers, who sell and service automobiles nationwide.

- There are 22,250 new vehicle dealerships in the U.S., according to the National Automobile Dealers Association. These dealerships recorded sales of \$608 billion in 1999.

- New vehicle dealers directly employ 717,400 Americans in jobs connected to new vehicle sales. Related employment arising from jobs in new vehicle sales is estimated at 1,209,200. Thus, dealers are directly and indirectly responsible for more than 1.9 million U.S. jobs.

- The compensation for these 1.9 million jobs is estimated at \$66 billion.



DEALER CONTRIBUTIONS

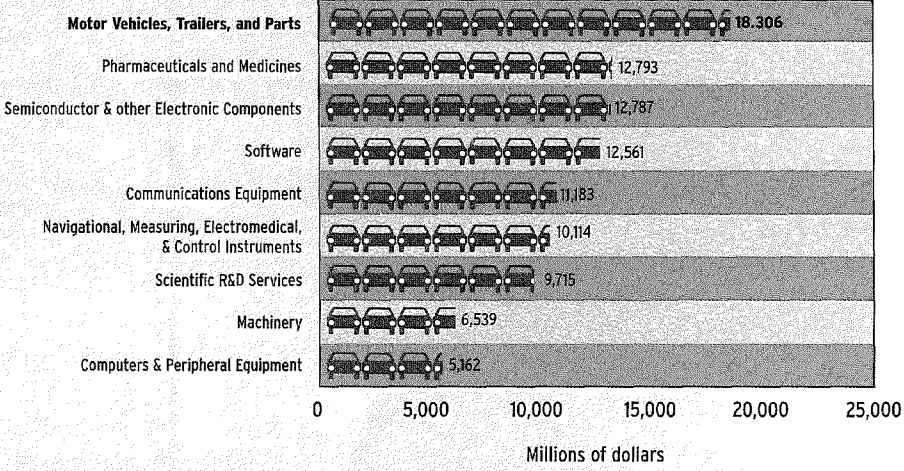
**INVESTING IN THE FUTURE IS THE
LIFEBLOOD OF A STRONG INDUSTRY
AND A HEALTHY ECONOMY.**

The auto industry leads all other industries, including the computer sector, in research and development investment.

The auto industry spent \$18.3 billion on research and development in 2000. Engineers and scientists have focused on developments in advanced technology to produce even cleaner and more fuel-efficient vehicles, along with a host of safety advancements.*

**R&D SPENDING
BY INDUSTRY, 2000**

The National Science Foundation (NSF) recently ranked the 39 largest industry groups in terms of 2000 industrial research and development spending in the United States. The automobile industry ranked first by a considerable margin over such manufacturing industries as communication equipment, drugs and medicines, and even the large computer services industry.



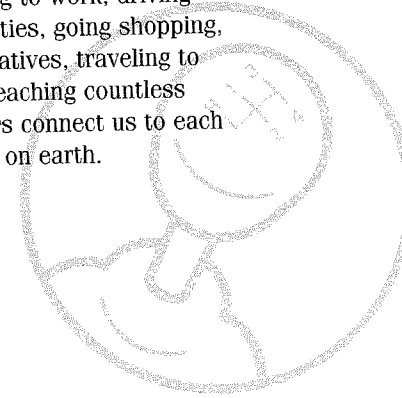
INVESTMENTS

CARS ARE SO INTERWOVEN IN THE FABRIC OF AMERICAN LIFE that we often overlook their value to consumers and the economy.

The personal automobile enables us to live, work and play in ways that were unimaginable a century ago. Indeed, automobility is a key driver of our well-being as a society.

Think about it: just about every car trip ends with either an economic transaction or some other benefit to our quality of life.

Whether it's commuting to work, driving kids to school or activities, going shopping, visiting friends and relatives, traveling to places of worship or reaching countless other destinations, cars connect us to each other like nothing else on earth.

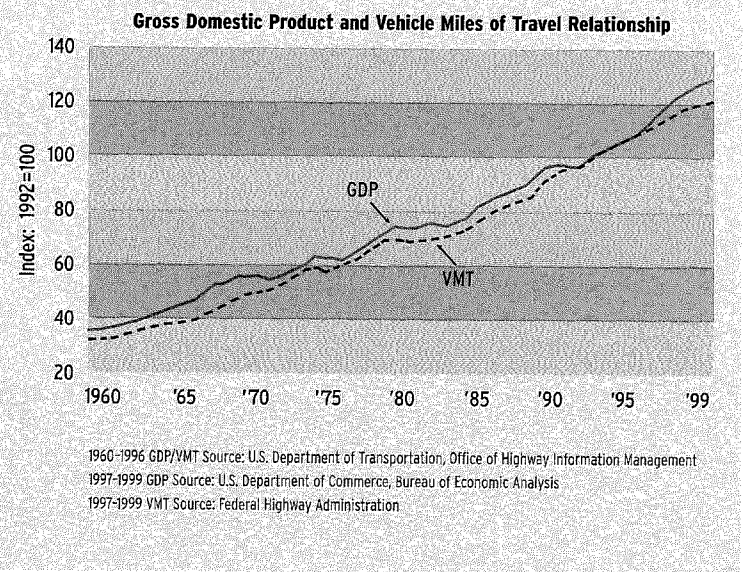


THE VALUE OF AUTOMOBILITY

- 95 percent of personal vehicle miles traveled in the United States (2.6 trillion miles) are done in personal motor vehicles, as opposed to public transportation of all types.
- There were about 17.2 million light vehicles sold in the United States in 2000, contributing to the 217 million vehicles on the road in 2000 that were driven by more than 191 million drivers.

The value of automobility can be summed up in one sentence: Cars allow people to go wherever they want whenever they want. If you can't get around at will, life becomes limited.

AUTOMOBILITY= PROSPERITY
Ups and downs of the U.S. economy track very closely with highway travel.



ABOUT THIS STUDY

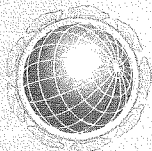
The information contained in this briefing booklet originates from a study conducted by the Institute of Labor and Industrial Relations at the University of Michigan and the Center for Automotive Research (CAR), in Ann Arbor Michigan. CAR is a premier research institution specializing in the automobile industry. For more information, log on to www.cargroup.org.

THE ALLIANCE OF AUTOMOBILE MANUFACTURERS sponsored this study, which is entitled the "Contribution of the Automotive Industry to the U.S. Economy." This study can be found at www.autoalliance.org.

* CAR released the study, entitled "Economic Contribution of the U.S. Economy – An Update" in 2003.



WHO WE ARE



Alliance of Automobile Manufacturers

www.autoalliance.org

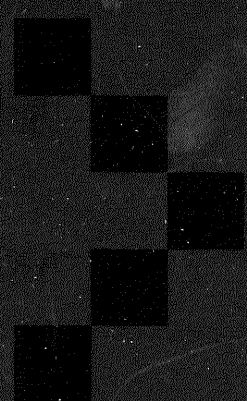
Advanced_Technology

VEHICLES

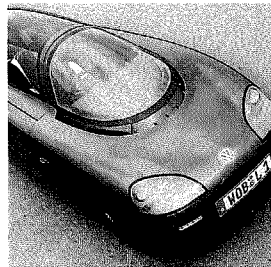


DRIVING INNOVATION

Advanced_Technology VEHICLES



INNOVATION



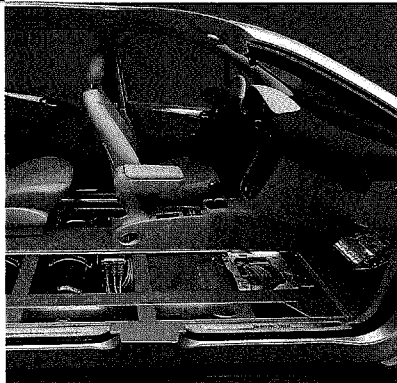
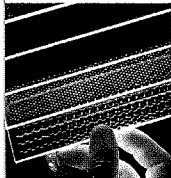
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DRIVING INNOVATION >

America's passion for automobiles has raced non-stop for more than a century, with no end in sight. Cars. Pick-up trucks. SUVs. Minivans. They keep us mobile. They offer versatility. And whether it's elegant classics, this year's hot new models, or futuristic concept cars, they fuel our dreams and stoke our imagination.



SO WHAT HAS KEPT THIS LOVE AFFAIR SO STRONG FOR SO LONG? Throughout the automobile's history, few industries have worked harder to keep its promises to an eager public. Engaging designs. Higher performance. And the most important promise of all: **creating exciting automobiles that are cleaner, safer, smarter, more reliable and more fuel efficient.**



WE'VE COME A LONG WAY TOWARD FULFILLING THESE PROMISES.

The computers now used in every new car on the road are more powerful than those that helped the Apollo program reach the Moon. They handle everything from airbag safety systems and anti-lock brakes to GPS systems and emissions control. Today's vehicles are also better for the environment. They run 99 percent cleaner than their counterparts from the 1970s.

MORE GOOD NEWS IS ON THE WAY.

Automakers are working on multiple pathways for advanced technology vehicles that run virtually emission-free on the road to achieving zero emissions vehicles.

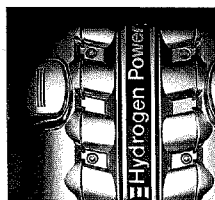
DRIVERS ARE LEARNING A NEW VOCABULARY.

Fuel cell. Hybrid electric. Clean diesel. Hydrogen. Alternative fuels. Cylinder deactivation. All of these terms are becoming familiar thanks to the billions of dollars that members of the Alliance of Automobile Manufacturers have invested in research, development, and deployment of advanced technology vehicles.

BRINGING ADVANCED TECHNOLOGY TO CONSUMERS IN LARGE NUMBERS, HOWEVER, REMAINS A CHALLENGE.

Consumers are accustomed to the comfort, safety, reliability and convenience of the internal combustion engine, and may hesitate to buy unfamiliar technology.

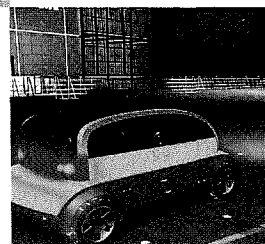
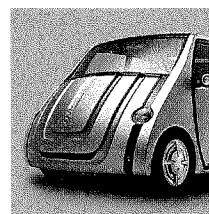
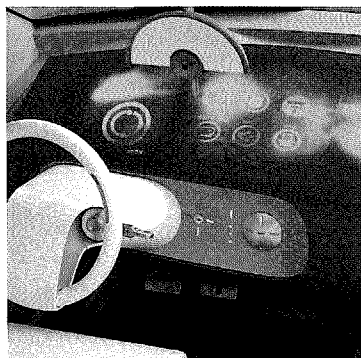
COST IS ALSO A BIG ISSUE. Any new technology is initially more expensive than the technology it has been designed to replace. Costs will remain high until consumers buy advanced technology vehicles in quantities large enough to bring costs down.



WHAT'S MORE, THERE ARE INFRASTRUCTURE CHALLENGES TO OVERCOME.

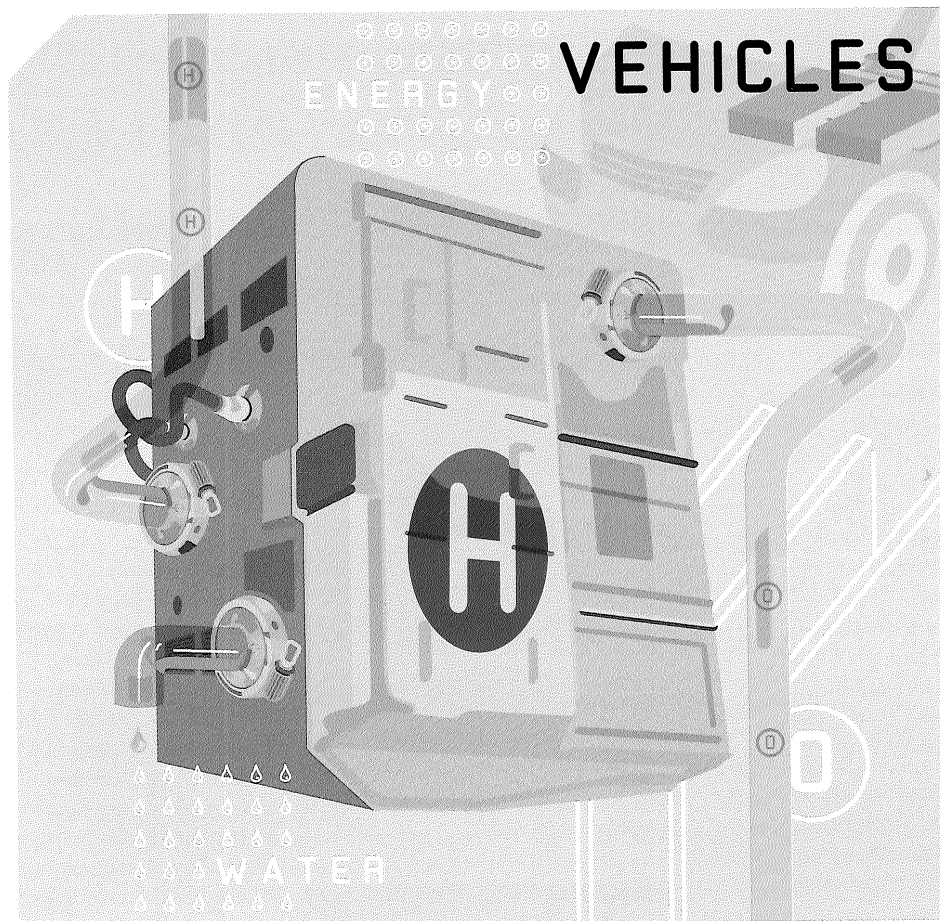
Before fuel cells can go mainstream, the support network of hydrogen refueling stations must be in place. Given that there are 180,000 gas stations in the United States, conversion to a hydrogen energy supply is a formidable challenge.

OTHER ADVANCED TECHNOLOGY VEHICLES, SUCH AS ADVANCED CLEAN DIESEL, REQUIRE ULTRA-CLEAN, SULFUR-FREE FUEL. Flex-fuel vehicles running on natural gas or ethanol also have special fuel needs. Automakers are proud that there are more than 3 million alternative fuel vehicles on the road today, and that number will grow as the fueling infrastructure is put into place.



OVERCOMING THESE HURDLES REQUIRES UNDERSTANDING. That's why we created this Advanced Technology Primer. You'll get a look at the exciting future ahead, and the advanced technology vehicles that are beginning to roll out.

| Fuel_Cell



The environment's new best friend. Fuel cells offer twice the fuel efficiency of internal combustion engines, and the only emission they produce is water vapor.

HOW FUEL CELLS WORK.

Fuel cells use hydrogen to produce continuous electric currents. They employ a process that chemically combines hydrogen and oxygen to produce electricity and water. Because each fuel cell produces less than one volt, they must be stacked in a row to produce enough voltage for the motor to meet your driving needs.

Electricity is produced when hydrogen is fed into one end of the fuel cell. There it meets a platinum anode that strips an electron from each hydrogen atom, producing an electric current and a stream of hydrogen ions. The electric current flows to the electric motor, supplying it with power. At the other end of the fuel cell, a platinum cathode brings together the stream of hydrogen ions coming from the platinum anode, the electric current returning from the electric motor, and oxygen. These three react to produce water.

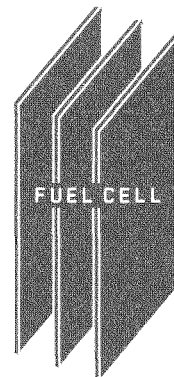
You're probably wondering where we get the oxygen and hydrogen to supply the fuel cell. Oxygen is easy. It comes from the air, all you'll ever need. Hydrogen is trickier. We can produce it by reformulating a hydrogen-containing fuel — such as gasoline, methanol, or natural gas, or through electrolysis of water, heat or chemical reactions.

FUEL CELLS ARE FLEXIBLE.

Fuel cells can be packaged into different shapes to fit into a vehicle's available space, so passenger room, cargo space and performance can be optimized.

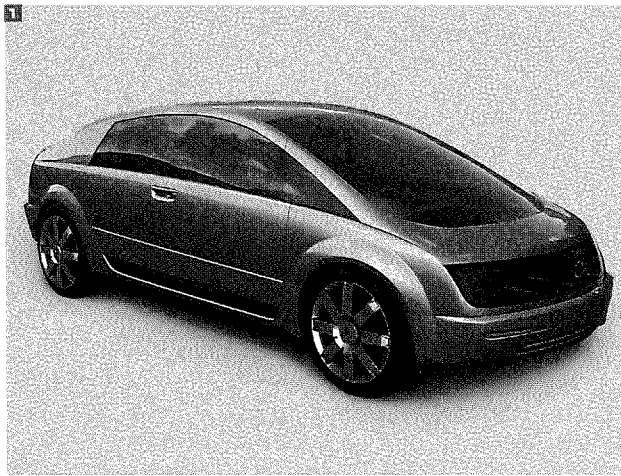
THE CHALLENGE OF FUEL CELLS.

Like other emerging technologies, there are many challenges to overcome including storage, infrastructure, customer acceptance and cost. As mentioned, hydrogen cannot be stored as easily as gasoline; it must be compressed or kept at very cold temperatures. Automotive research continues to determine the best form of hydrogen to use as a fuel (i.e. solid, liquid, gaseous) and develop high pressure storage systems to increase vehicle range. Additional, non-automotive, research should occur concurrently to develop an emission free method of hydrogen generation, transportation and bulk storage and distribution. In early years, incentives to minimize cost discrepancies between technologies will considerably hasten customer acceptance of new technology. As has been seen in the past, as orders grow costs come down due to mass production.



Fuel_Cell_Vehicles

1 Hy-wire is so advanced that GM has more than 30 patents in progress covering business models, technologies, and manufacturing processes. The Hy-wire's fuel cell propulsion system is housed entirely in an 11-inch thick skateboard-like chassis. By-wire controls use electrical signals instead of mechanical links or hydraulics to control steering, acceleration and braking. Without an engine, steering column, or other conventional vehicle components, this concept provides unprecedented design freedom.



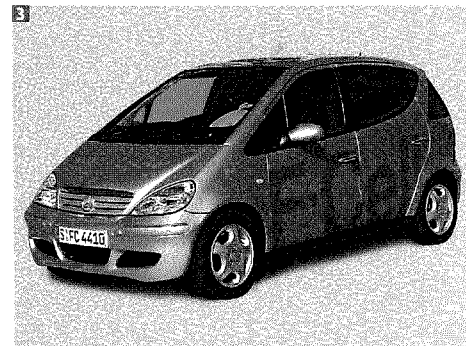
2 The Toyota FCHV system features four 5,000-psi hydrogen fuel tanks. Hydrogen gas feeds into the fuel-cell stack where it is combined with oxygen. This chemical reaction forms water and generates a peak of 90 kW of electricity. The electricity from the fuel cell powers the 109-hp (194 lbs-ft of torque) electric motor and charges the vehicle's nickel-metal hydride batteries, which also feed power-on-demand to the electric motor. Water vapor is emitted through the vehicle's tailpipe.

3 The Volkswagen Bora HY.POWER's electric motor is rated at 75 kW (102 bhp) and obtains its power from a fuel cell that discharges only water vapor during operation. The HY.POWER prototype uses on-board hydrogen to create a hydrogen fuel cell. Fuel cells that use hydrogen offer zero emissions; fuel cells that use gas with reformers offer near-zero emissions.



3 The DaimlerChrysler F-Cell passenger car is the latest in the company's line of fuel cell cars. DaimlerChrysler has also deployed fuelcell buses in Europe and Australia

and fuel cell vans in Europe and the United States. The F-Cell's clean, quiet, efficient powertrain is housed in the car's floor, with no loss of passenger or cargo space.





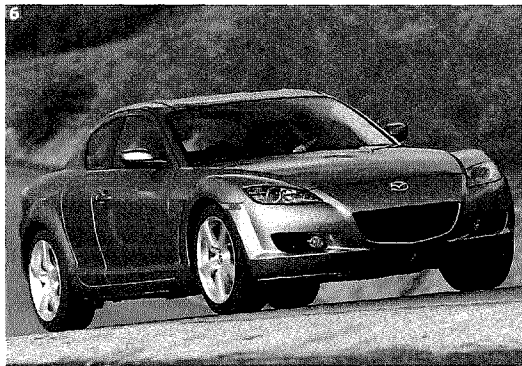
HYDROGEN ICE (INTERNAL COMBUSTION ENGINE)

Not as well known in the United States, but possibly serving as another bridge technology to a hydrogen economy are hydrogen ICEs. The concept of using hydrogen in internal combustion engines offers several advantages: near-zero net emissions, maintaining the utility and flexibility of today's automobile and helping to promote a hydrogen fueling infrastructure.

Hydrogen emits water vapor when burned, and has the potential to be an environmentally friendly alternative. However, only a handful of public hydrogen refueling stations currently exist in the world, thereby limiting today's use of the technology. By using hydrogen ICEs as a bridge technology, perhaps cost per vehicle can be kept reasonable and help promote vehicle availability as well as the necessary infrastructure



5 The BMW 745h is a five-passenger luxury-performance sedan, powered by a 4.4 liter V8 engine, which runs on either liquid hydrogen or gasoline. The 750hL has a range of about 250 miles. With its dual fuel capacity, the 750hL can be switched to gasoline operation should it become necessary, eliminating any restrictions that might be imposed by range or hydrogen availability. The 745h also employs today's fuel cell technology to power the vehicle's electrical system. This source provides more power than a conventional battery, allowing, for example, the air conditioning or heating system to be operated with the engine off. Currently, BMW is further refining this hydrogen power plant and incorporating it into the new 7 Series sedans.



6 This technological concept vehicle powered by the Mazda RENESIS hydrogen rotary engine is now undergoing running tests. The hydrogen version of RENESIS is the latest example of the company's efforts to satisfy the demand for both environment-friendliness and exhilarating performance. By making the most of the unique rotary-engine technologies, Mazda was able to develop

this powerplant as one proposal for alternative-energy vehicle technologies aimed at a future hydrogen-based society.

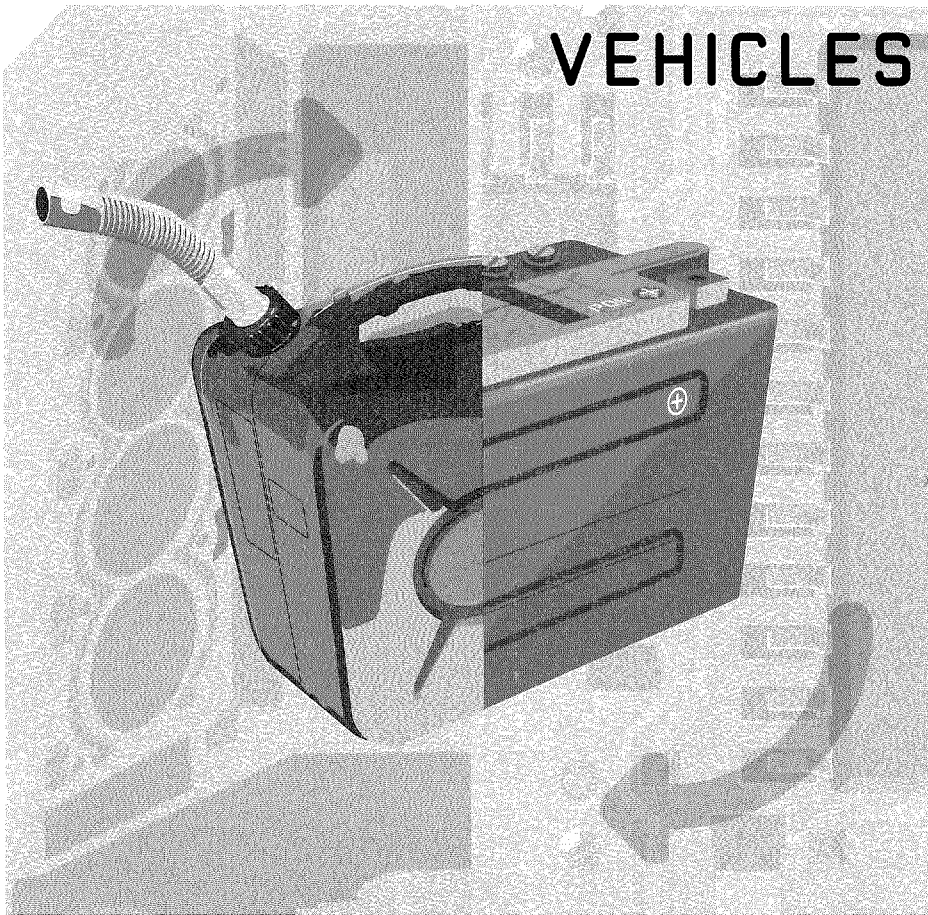
In addition to direct hydrogen injection into the intake chambers via two electronically-controlled injectors per rotor, the Mazda RX-8 Hydrogen RE features a dual-fuel system allowing one-touch switching between either hydrogen or gasoline, promoting the car's versatility as a hydrogen fuel infrastructure is developed.

7 A 2.3-liter, four-cylinder supercharged, intercooled hydrogen internal combustion engine, coupled with a hybrid electric transmission, propels the Ford Model U. It offers enhanced fuel economy—the equivalent of 45 miles per gallon and about 300 miles of range—plus near-zero regulated emissions and a 99-percent reduction in carbon dioxide. The powertrain also features Ford's advanced Modular Hybrid Transmission System, a way to simplify hybrid electric vehicle (HEV) technology in manufacturing, while contributing to significant fuel economy improvements.



| Hybrid_Electric

VEHICLES



Here and Now. Hybrid Electric Vehicles (HEVs) provide quantum improvements in fuel efficiency and reduced carbon dioxide emissions while requiring no changes to the existing gasoline fuel infrastructure. HEVs are considered a bridge technology on the way to achieving an emission-free fuel cell vehicle.

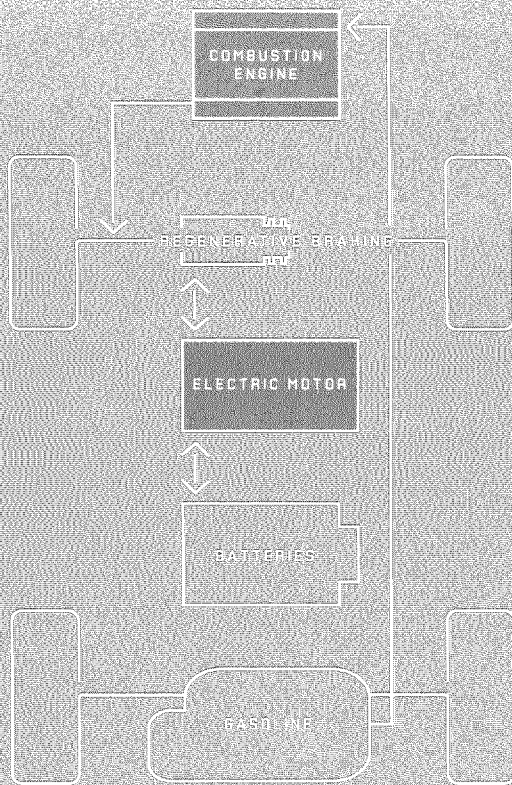
WHAT ARE HYBRID ELECTRIC VEHICLES?

Hybrid Electric Vehicles (HEVs) are an evolutionary new powertrain that utilizes a battery powered electric motor, a gasoline internal combustion engine, and a concept known as regenerative braking. To optimize performance, emissions, and fuel efficiency a computer is used to manage the energy from these three systems. The computer senses the driving style and then directs energy from either the battery system or the gasoline engine to the most appropriate drive train component, an electric motor or a drive shaft. Utilizing these hybrid technologies, an up to 25 percent improvement in fuel economy over conventional automobiles can be achieved.

HOW DO HEVs STACK UP AGAINST PURE BATTERY ELECTRIC VEHICLES?

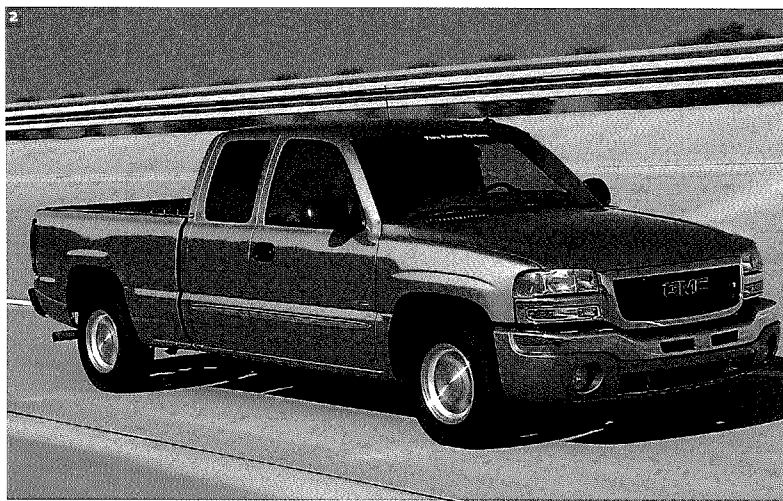
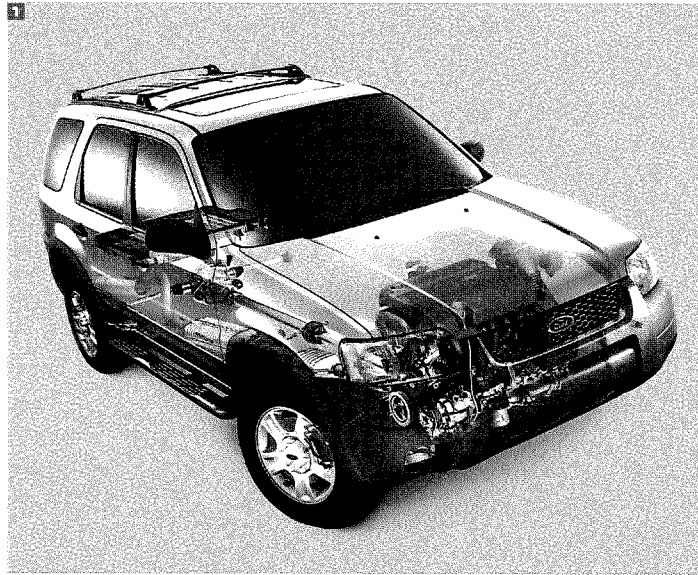
Easy. They have greater range because of the added energy from the fuel-powered engine and regenerative braking. Pure battery-electric cars require regular charging.

For now, cost remains an important issue for HEVs. Because hybrid electrics use two separate powertrains, they cost more than internal combustion engine-only cars. To narrow the cost gap between typical cars and hybrids, the IRS has approved a one-time tax deduction for hybrid buyers.

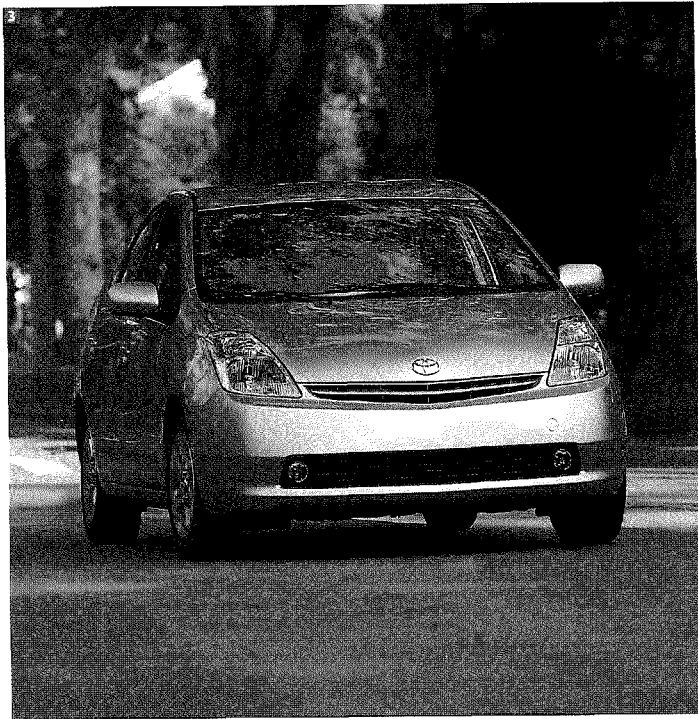


Hybrid_Electric_Vehicles

1 The Ford Escape Hybrid will feature an electric drivetrain to augment its fuel-efficient, 4-cylinder gasoline engine. With regenerative braking and nearly instantaneous start-stop capability, the Escape Hybrid will be especially fuel-efficient in city traffic. The Escape Hybrid will deliver acceleration performance similar to an Escape equipped with a V-6 internal combustion engine. The Escape Hybrid will have a driving range of more than 500 miles on a single tank of gasoline. It will be available to consumers in late 2004.



2 The Chevrolet Silverado and GMC Sierra Flywheel Alternator Starter Hybrid System allows uncompromised power and torque while increasing fuel economy by 10 to 12 percent. This flexible, functional "generator on wheels" has four 120-volt outlets and enough capacity to power tools on a work site or appliances at a campground. It will be available to consumers in 2004.



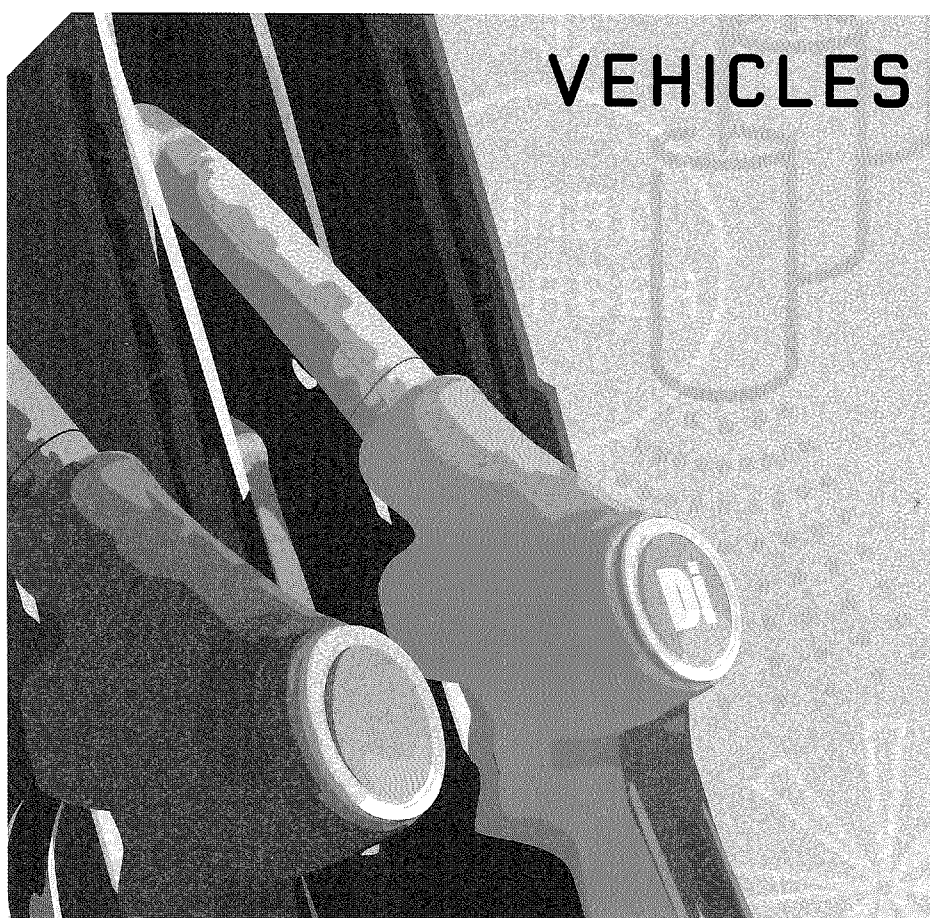
3 The new Prius is the first Toyota product to employ Toyota's Hybrid Synergy Drive, a third-generation, electric-gas hybrid powertrain technology. The new system produces more power from both the gasoline engine and the electric motor, giving the new Prius acceleration comparable to a 4-cylinder midsize car. The 2004 Prius can accelerate from 0-60 MPH in about 10 seconds and has a combined EPA mileage estimate of 55 MPG. Toyota will also introduce hybrid versions of its Highlander and Lexus RX SUVs in fall 2004.

4 The diesel electric hybrid Dodge Ram heavy-duty pickup has an integrated starter-generator powertrain that produces up to 10 percent better fuel efficiency and enhanced performance on the road. Off the road, the powertrain converts to a clean generator to provide electric power in remote sites.



Clean_Diesel

VEHICLES



Technological advances have resulted in clean diesel automobiles that offer greater fuel economy, while delivering the performance and durability the consumers demand. Diesel has become “clean diesel” through advanced engine and emission control technologies in conjunction with ultra-low sulfur fuel.

A NEW GENERATION.

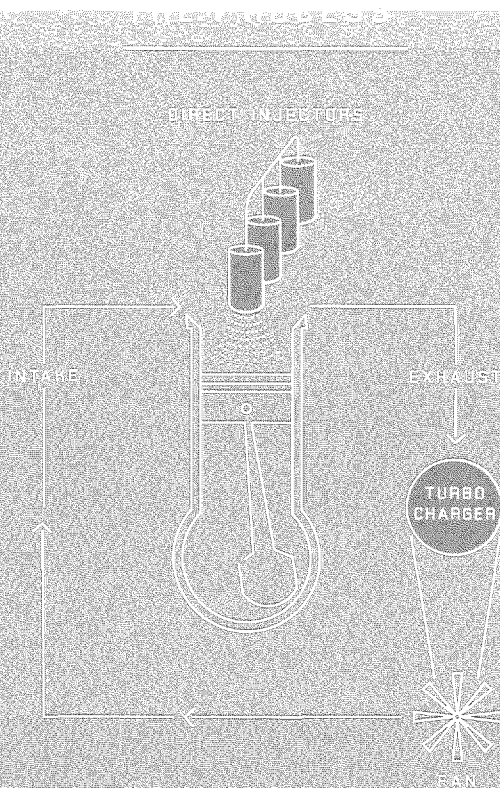
Compared to their gasoline counterparts, the emerging new generation of clean diesel vehicles will offer greater fuel economy while delivering better performance. Around the world, consumers are favoring advanced diesel technology. Clean diesel powers 40% of Europe's new light duty motor vehicles.

Today's diesel vehicles run more cleanly, thanks to new fuel injection, combustion and exhaust after-treatment technologies. And the auto industry is working now to introduce technologies that will allow diesel automobiles to meet the Environmental Protection Agency's latest emissions regulations. A key factor in determining the success of these aftertreatment technologies was the EPA's 2001 decision to require dramatic sulfur reductions in diesel fuel. This decision was critical for the sale of clean diesel vehicles in the U.S.

THE IMPROVEMENTS ARE DRAMATIC.

Clean diesel vehicles are more fuel-efficient than gasoline-powered vehicles, especially, in stop-and-go city driving. On average, clean diesel vehicles achieve 20-40% better fuel economy than their gasoline-powered counterparts.

Clean diesel vehicles cost significantly more to produce than conventional vehicles. As with all low volume, new technology vehicles, Congress can help get clean, highly fuel-efficient vehicles on the road more quickly in greater volumes by providing consumer tax incentives for clean diesel automobiles.



Clean_Diesel_Vehicles



1 In Europe, the 2003 BMW 530d gets 30.2 MPG, versus 23.8 MPG for its gasoline counterpart. **2** The 2003 BMW 740d sedan gets 28.9 MPG, compared to 24.4 MPG for the gasoline version.

3 The Jeep Liberty diesel will be powered by a 2.8-liter common rail turbo-diesel engine and will be available with two- or four-wheel drive. The diesel-powered Liberty will have up to 30 percent better fuel efficiency compared with a comparable gasoline-powered Liberty.



4 The Ford Mondeo TDCi TDCi power is easy on your pocket—and the environment. Common-rail technology delivers outstanding fuel economy, low running costs and reduced emissions. It uses a two-stage injection—a pilot and a main injection. Because the fuel is

injected in smaller bursts, the resulting smooth, progressive fuel combustion is quieter and more efficient. Which means you spend more time on the road, enjoying the engine's power and refinement, and less time stopping to fill up.



5 The Mercedes E320 CDI (Common-rail Direct Injection) uses an electronic fuel injection system that once was considered technically impossible on diesel engines. CDI works by electronically maintaining a precise, constant high level of fuel pressure (according to speed and throttle) to each of the engine's six injectors. Fuel injection using the CDI system softens diesel "power pulses" resulting in smoother, quieter, and more powerful performance.

6 The stylish and versatile Volkswagen Passat TDi gets 28 MPG, about a 32% increase over its gasoline counterpart, which gets 21.4 MPG.

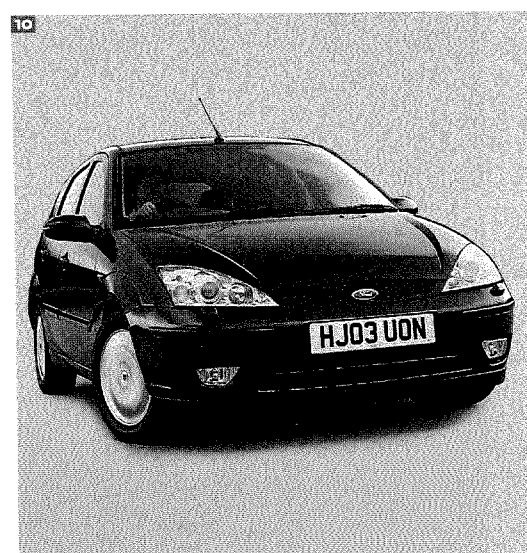
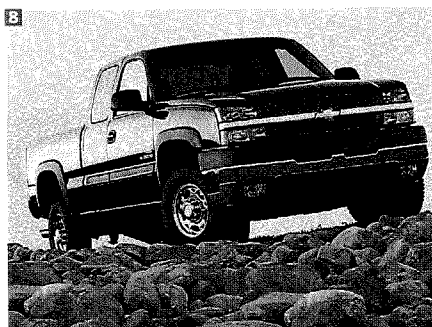


9 The Audi A8 TDi, a premium sports sedan, gets 29 MPG, compared to 20 MPG for the gasoline version.



7 Saab 9-5 with a 3.0L V-6 common rail turbo diesel engine is 25 percent more efficient than the 4-cylinder gas counterpart.

8 Chevrolet Silverado's latest generation Duramax V-8 diesel engine delivers more horsepower and torque, while reducing NOx emissions by nearly 50 percent.

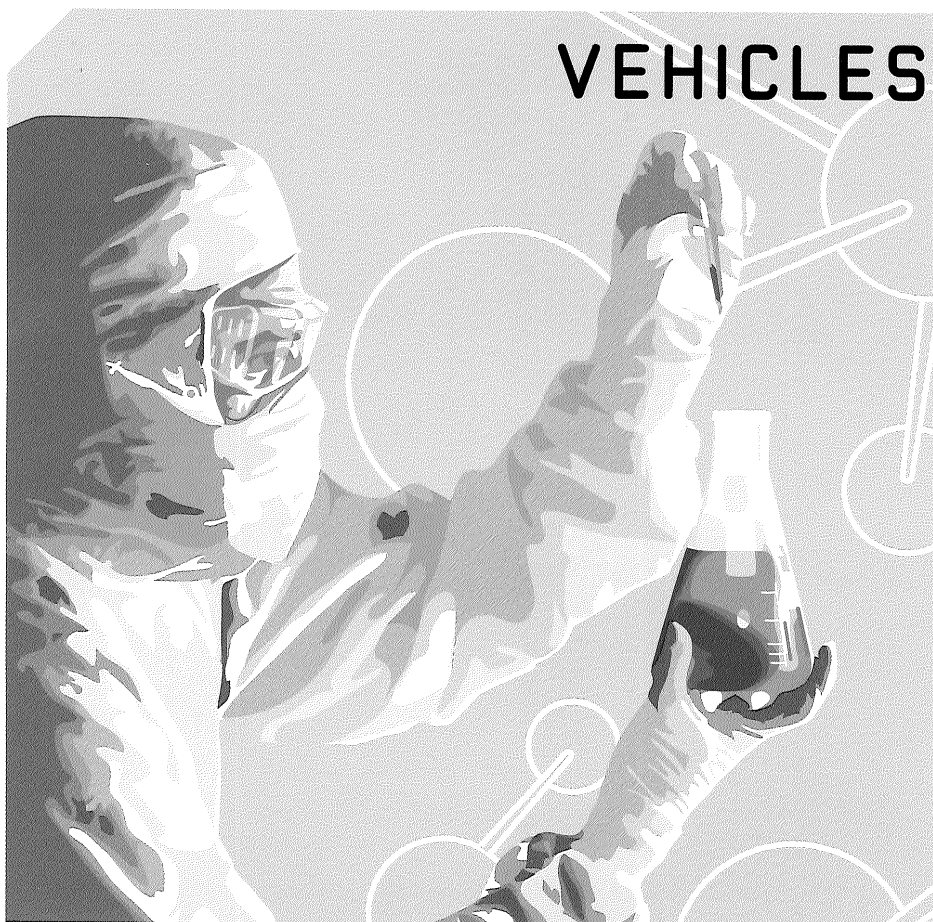


10 The Ford Focus TDi. Refined, responsive and quiet. These are the hallmarks of the new generation. Ford diesel found in the widely popular Focus—the Duratorq TDi. With its advanced engine refinement and superb performance, you could mistake it for a gasoline engine.

The new Duratorq TDi engine leads the way in fuel economy and running costs. On average you will find a TDi engine will travel 13 miles further per gallon than a gasoline engine of comparable size. In addition, the engine is incredibly quiet. Using new Noise Reduction Technology called 'accelerometer pilot control' (APC), the TDi engine 'listens' to itself to monitor noise levels. Finally, Ford's Duratorq TDi engine emits almost 20% less carbon dioxide than a gasoline engine.

Alternative_Fuel

VEHICLES



Finding substitutes for oil. Finding cleaner, more efficient alternatives to gasoline for internal combustion engines has been one of the long-term goals of the automobile industry. While the research continues, several beneficial fuels are in use today—and are gaining popularity.

ALTERNATIVE FUEL VEHICLES.

More than 3 million alternative fuel vehicles are now on the road. But increasing that number remains a challenge. Fueling these vehicles requires new infrastructure, with special pumps for such fuels as ethanol and natural gas. Consumers may be reluctant to buy alternative fuel vehicles unless they are assured that fueling these vehicles will be as convenient as stopping at the local gas station. And gas station owners may be reluctant to build additional special pumps unless they are assured that there will be enough vehicles on the road to make them worthwhile.



BIOFUELS.

Biofuels such as ethanol made from starch and biodiesel made from vegetable oil already clean our air and help support our rural economies. Biodiesel is produced through a process in which organically derived oils are combined with alcohol (ethanol or methanol) in the presence of a catalyst to form an ethyl or methyl ester.



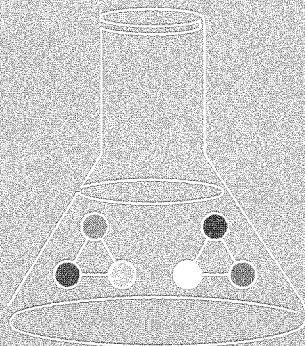
NATURAL GAS.

As a fuel alternative, natural gas is, well, a natural. It burns cleanly, reducing carbon monoxide emissions by 65-90 percent, and almost eliminates particle emissions entirely. Natural gas is also widely available. The U.S. and Canada have significant deposits. Plus, the U.S. has gas distribution pipelines and several refueling stations.



PROPANE.

Propane is the most accessible of the liquid and gaseous alternative fuels. More than 10,000 publicly accessible fueling stations operate throughout the United States, where there are more than 350,000 on- and off-road propane-powered vehicles. About 3.5 million of these vehicles are in use worldwide. This shouldn't be a surprise. Propane has been used as a transportation fuel around the world for more than 60 years.





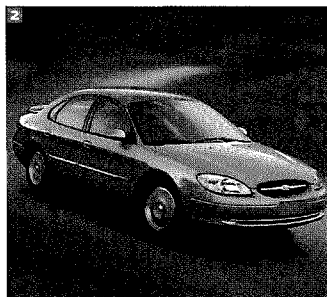
BIOFUELS.

Biodiesel is produced through a process in which organically derived oils are combined with alcohol (*ethanol or methanol*) in the presence of a catalyst to form an ethyl or methyl ester.

Ethanol can be produced from a variety of renewable resources, such as corn and grain. Researchers are investigating how to make ethanol from the wood and plant cellulose found in biomass, which could make ethanol economically viable as well as ecologically sound.

1 VW GolfTDi uses SunFuel,[®] a new synthetic diesel fuel produced from biomass. It is completely free of sulfur and aromatic compounds and is CO₂-neutral, as its combustion in the engine only releases the CO₂ back into the atmosphere that a plant absorbed while it grew.

Ford makes a **2** Taurus that runs on ethanol. The vehicles are called Flexible Fuel Vehicles (FFVs) because they can run on any combination of gas and up to 85 percent ethanol in the same tank. Ford introduced FFV products with the Taurus in 1993.



3 DaimlerChrysler has sold more than one million flexible fuel vehicles, capable of running on gasoline or E85 fuel comprising 85 percent renewable ethanol. The 2004 Dodge Ram 1500 truck with 4.7-Liter V-8 engine and Dodge Stratus and Chrysler Sebring sedans equipped with 2.4-liter engines are the latest of the company's vehicles to come equipped with E85 capability.

4 There are currently more than 3 million E85 vehicles on American roads — more than 1 million of them produced by GM. All GM full size SUVs equipped with the Vortec 5300 engine are E85-capable, including the Chevrolet Tahoe and Suburban and the GMC Yukon and Yukon XL. The Chevrolet Silverado

and GMC Sierra full size pickups also are available with E85 capability. E85 alternative fuel composed of 85 percent ethanol and 15 percent gasoline used in Flexible Fuel Vehicles helps reduce greenhouse gas emissions and enhance energy security by providing an alternative to petroleum fuels.

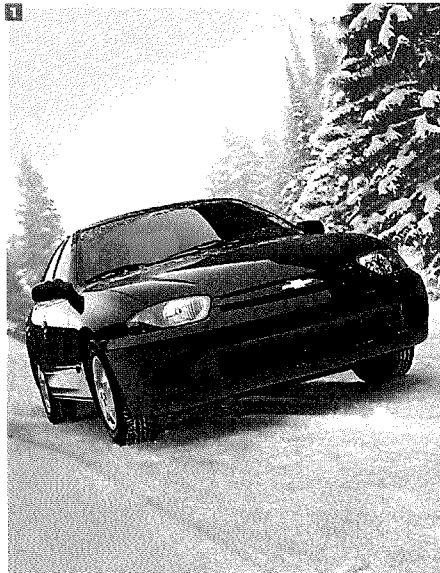


NG

NATURAL GAS.

Lighter than air, natural gas is found in deposits 3,000 to 15,000 feet below the surface of the earth. It is available in two forms: compressed or liquefied (CNG and LNG). CNG vehicles have a very good safety record, partly because of strict design regulations.

This attractive alternative, however, does face challenges. Natural gas vehicles need about four times the fuel tank volume to provide the same driving range as gasoline vehicles. As a result, natural gas vehicles require a potential trade off: less driving range or compromised cargo capacity. What's more, natural gas fuel tanks, as well as the required fittings, add significant cost to these vehicles.



1 The Chevrolet Cavalier is a Bifuel CNG sedan with a 2.2-liter engine; four-speed automatic transmission. It has a 6.2-gge CNG capacity at 3,600 psi, with 14.3-gallon gasoline tank for total driving range of up to 411 miles.



P

PROPANE.

Propane is the popular name for liquefied petroleum gas, or LPG. This liquid mixture consists of at least 90 percent propane, butane and higher hydrocarbons; the balance is ethane and propylene. Propane is a by-product of natural gas processing or petroleum refining.

The driving range for LPG-powered vehicles is a little less than that of comparable gasoline-powered vehicles. But because LPG is stored as a liquid, its driving range is greater than that of CNG-powered vehicles. Power, acceleration, payload, and cruise speed are all comparable with those you would get using a gasoline engine.

1 Ford offers a bi-fuel propane, F-150, light-duty pick-up truck that runs on propane or gasoline.



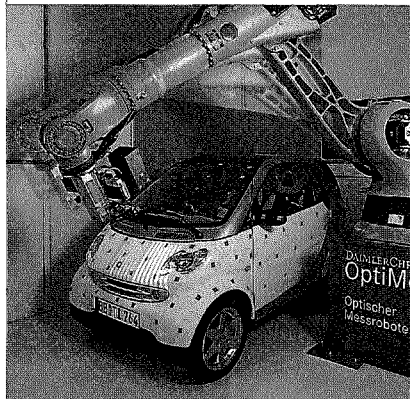


Advanced_Technology_VEHICLES

Advanced technology vehicles of all kinds offer hope and promise for the future. Whether it's achieving greater fuel economy or reducing the reliance on oil as a primary fuel source, automakers remain committed to populating America's roadways with the latest innovative vehicle technologies.

Congress can help get clean, highly fuel-efficient vehicles on the road more quickly in greater volumes by providing consumer tax incentives.

The challenge remains getting consumers to accept these new cars and light trucks in large numbers. But as consumers learn more about advanced technology vehicles, their acceptance grows. That's why we've created this document: *to educate consumers and encourage them to look at an advanced technology vehicle when they start looking for their next new car.*



Want to know more?

Visit the Alliance at www.autoalliance.org.

DRIVING INNOVATION >





1401 Eye Street, NW
Suite 900
Washington, DC 20005

BMW Group

DAIMLERCHRYSLER



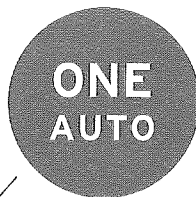
PORSCHE TOYOTA



HOW MANY U.S. JOBS

can you fit

INSIDE



An Overview of the
Economic Contributions of the
U.S. Automobile Industry

AMERICA'S AUTOMOBILE INDUSTRY:

The Engine that Drives the Economy

America's automobile industry doesn't just manufacture the passenger cars and light trucks that millions of Americans depend on for work, shopping, vacation and other mobility needs. Auto manufacturers, along with their suppliers and dealers across the country, drive the U.S. economy, and that economic engine has more horsepower than many people realize.



*45,000
aluminum, iron
and steel workers*

A significant number of the jobs in many of America's leading industries are dependent on the automobile. In 2001, about 32% of aluminum, 31% of iron and 14% of U.S. steel purchases could be attributed to the auto industry, creating jobs for 45,000 aluminum, iron and steel industry employees. Another 95,000 rubber and plastic jobs, 24,000 glass manufacturing jobs, and 34,000 textile jobs are related to autos.



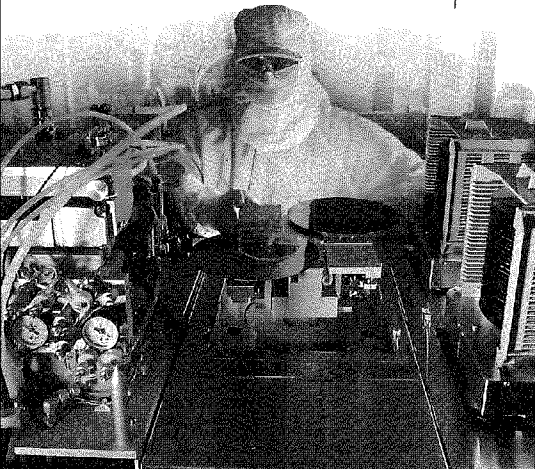
*180,000
U.S. workers*

More than 180,000 U.S. workers were engaged in fabricated metal products manufacturing for autos in 1998, while nearly 80,000 U.S. workers were employed in industrial machinery and equipment manufacturing industries related to autos.

Jobs, Jobs, Jobs

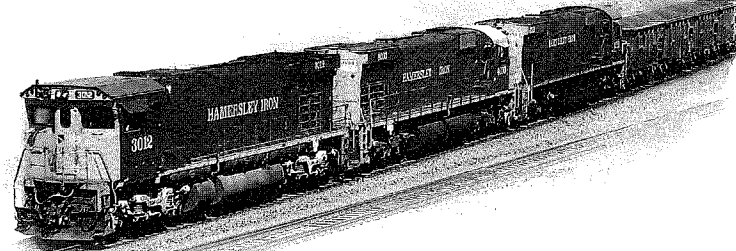
If you look closer at the auto industry, you'll find many of America's leading industries. By using so many products and services from America's major industries, the auto industry drives up employment across the United States.

ONE
AUTO



Many sectors of the service economy rely on autos as a major customer. In 1998, 70,000 U.S. jobs in the trucking and warehousing industry depended on autos. About 70% of U.S. motor vehicles are shipped by railroads, creating jobs for 18,400 rail employees. More than 47,000 people in the advertising industry are employed because of auto advertising.

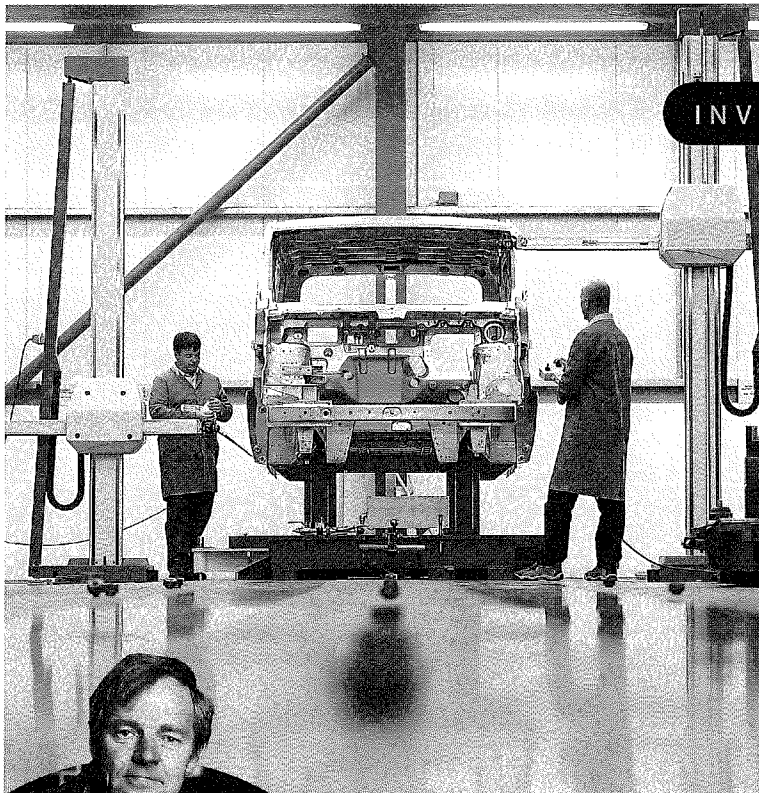
*18,400
rail employees*



*40-50
microprocessors
average per auto*

The auto industry uses world-class technology in its vehicles. The average auto contains 40-50 microprocessors—far more computing power than the computers for the Apollo Moon Mission. In 1998, the auto industry was responsible for more than 59,000 jobs in the electronics industry.

\$18.3 billion in Research and Development in 2000



INVESTING IN THE FUTURE

The auto industry leads all other industries, including the computer, electronics and pharmaceutical industries, in research and development investment. The auto industry spent \$18.3 billion in research and development in 2000. Engineers and scientists have focused on developments in advanced technology to produce even cleaner and more fuel-efficient vehicles, along with a host of safety advancements.

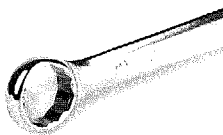
The National Science Foundation ranked the largest industry groups by research and development spending in 2000.



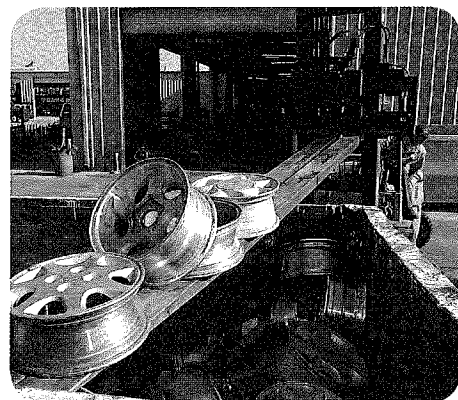
46,000
auto salvage workers

The auto industry is committed to recycling: 95% of motor vehicles are processed annually for recycling, with 75% of the materials in those vehicles salvaged for re-use. About 80% of the aluminum used to manufacture vehicles is recycled aluminum. The thriving U.S. salvage industry employs 46,000 workers who rely on autos.

Motor vehicles require routine maintenance throughout the year, creating jobs for many Americans. Almost 680,000 workers are employed by auto repair businesses. About 335,000 people work at automotive parts stores. More than 140,000 people are employed at tire dealerships. More than 135,000 workers are employed at car washes.



680,000
auto repair workers



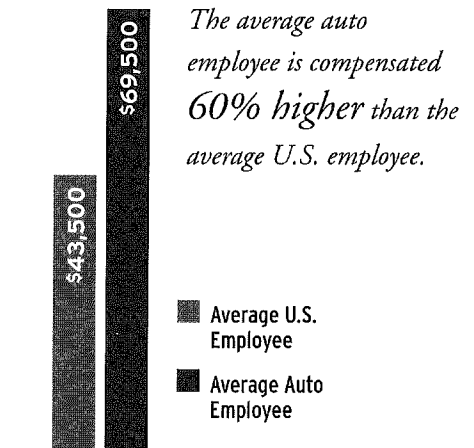
No other single industry is linked to so much of U.S. manufacturing or generates so much retail business and employment.

One out of every 10 jobs in the U.S. is dependent on new vehicle production and sales.

- ▶ One out of every 10 jobs in the U.S. is dependent on new vehicle production and sales.
- ▶ America's automobile industry is one of the largest industries in the country. When jobs dependent on the industry are included, the auto industry is responsible for 13.3 million jobs nationwide, or about 10% of private sector jobs.
- ▶ The auto industry directly employs workers in every state.

Automotive manufacturing provides among the highest levels of wages and benefits in the U.S.

- ▶ The contribution of automotive manufacturing to compensation in the private sector is estimated at \$243 billion, or 5.6% of U.S. private sector compensation.
- ▶ The average compensation received by employees in the auto industry was \$69,500 in 2001, or 60% higher than the average U.S. job (\$43,500).



Leading Economic Indicators

3.3%
of America's GDP

A Significant Contributor to GDP: In 2002, more than 3.3% of America's total gross domestic product was generated by the sale and production of new light vehicles.

Growing Output: The U.S. automotive industry produces a higher level of output in the U.S. than any other single industry, and this output has been growing. When measured in constant 1996 dollars, automotive economic output increased by 51 percent during 1987-2002.

High Productivity: The productivity of the auto industry can be compared with other U.S. industries through value added per employee (the actual value produced by an employee). The auto industry's value added of \$292,000 per worker was 143% higher than the overall value-added ratio for U.S. manufacturing of \$120,000.

143%
higher

*value-added ratio
than average U.S.
manufacturing.*

Lower Unemployment Rate: In 1999, when the national unemployment rate was 4.2%, the measured unemployment rate for those reporting employment in the auto industry was 2.9%. In the Fall of 2002, when the national unemployment rate was 5.8%, the unemployment rate for the auto industry was 5.4%.

\$74
billion in exports

Exports: Automotive exports rose from \$33.4 billion in 1988 to a record \$74 billion in 1997, an increase of 122%.

This information originates from two studies. The first study, "Contribution of The Automotive Industry to the U.S. Economy" was prepared by the University of Michigan and the Center for Automotive Research (CAR) and issued in March 2001. In 2003, CAR issued the "Economic Contribution of the Automotive Industry to the U.S. Economy—An Update." Both studies are available at www.autoalliance.org and www.cargroup.org.

CAR

CENTER FOR AUTOMOTIVE RESEARCH

The Center for Automotive Research is an independent non-profit research and conference organization focusing on the continuing viability of the international automobile industry in North America.



Alliance OF AUTOMOBILE MANUFACTURERS®

The Alliance of Automobile Manufacturers is a trade association of 9 car and light truck manufacturers including BMW Group, DaimlerChrysler, Ford Motor Company, General Motors, Mazda, Mitsubishi Motors, Porsche, Toyota and Volkswagen. One out of every 10 jobs in the U.S. is dependent on the automotive industry. No other industry is linked to so much U.S. manufacturing or generates more retail business and employment. For more information, visit the Alliance website at www.autoalliance.org.

BMW Group DAIMLERCHRYSLER



PORSCHE

TOYOTA



The Alliance of Automobile Manufacturers
1401 Eye Street, NW, Suite 900
Washington, DC 20005 (202) 326-5500

Every auto depends on America's Strongest Industries

In 2003, the Center for Automotive Research issued the *"Economic Contribution of the Automotive Industry to the U.S. Economy—An Update."* Here are highlights of this report. For more information on the auto industry's economic contributions, visit www.autoalliance.org and www.cargroup.org.

Painting and Coating

4,458 jobs

- 100 million gallons of paint in 2001, accounting for 8.4% of U.S. paint, with a total value of \$2.9 billion, went into autos.
- The auto industry's use of paint provided 4,458 jobs in the paint industry in 2000.



Automotive Dealerships

717,400 jobs

- In the U.S., there are nearly 22,000 new vehicle dealerships that employed 717,400 people in 1998.
- An additional 1,209,200 people were employed in 1998 in industries that supply new vehicle dealerships, including workers in credit and finance, construction, trucking, and wholesale and retail trade.

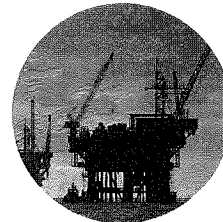
Used Vehicle Automotive Retail

- 92,752 people were employed in used vehicle sales, with another 328,843 people employed in used vehicle operations and off-warranty service.



Fuel

- 42,100 workers were employed in petroleum refining.
- 21,100 people were employed manufacturing oil and gas field equipment.
- 81,684 gasoline stations with convenience stores employed 613,957 people, while another 308,105 people worked at the 45,000 gasoline stations without convenience stores.



Petroleum

63,200 jobs

Gasoline Stations

922,062 jobs

Tire Dealerships

142,664 jobs



Rail

18,400 jobs

- Automobile-related shipping accounts for 1,265,000 carloads of railroad freight, or 8% of total annual carloads carried by America's railroads.
- 18,400 people were employed by all U.S. railroads as a result of automotive freight.

Trucking and Warehousing

- In 1998, 4% of all U.S. workers employed in the trucking and warehousing industries were engaged in producing automotive products, numbering 70,700 jobs.



Trucking

70,700 jobs

Advertising

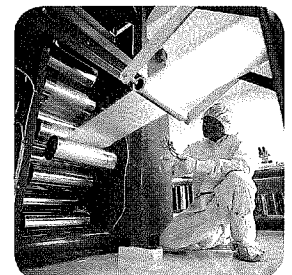
47,144 jobs

- \$14.6 billion, or 16.6% of total domestic advertising in 1999, was spent on automotive-related advertising.
- 47,144 people were employed due to automotive advertising in 1999.

Plastics and Rubber

95,200 jobs

- In 2001, the typical car contained 253 pounds of plastic, or 8% of the vehicle's weight.
- 1,990,730 tons of plastic in 2001, accounting for 3.9% of U.S. plastic consumption, went into autos.
- In 2001, the typical car contained 145.5 pounds of rubber, or 4% of the vehicle's weight.
- 1,945,000 metric tons of rubber in 2001, accounting for 68% of U.S. rubber consumption, went into autos.
- In 1998, 9% of all U.S. workers employed in Rubber and Miscellaneous Plastic Products industries were engaged in producing automotive products, numbering 95,200 jobs.



Glass

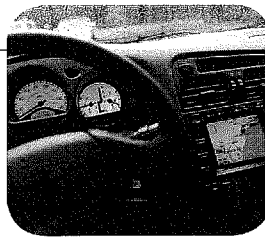
23,578 jobs

- In 2001, the typical car contained 98.5 pounds of glass, or 3% of the vehicle's weight.
- 1,238,447 tons of glass, accounting for about 23% of U.S. glass consumption, went into autos in 2001.
- Adjusted for imports, the auto industry's use of glass provided 23,578 jobs in the U.S. glass industry in 2000.



Heating and Cooling

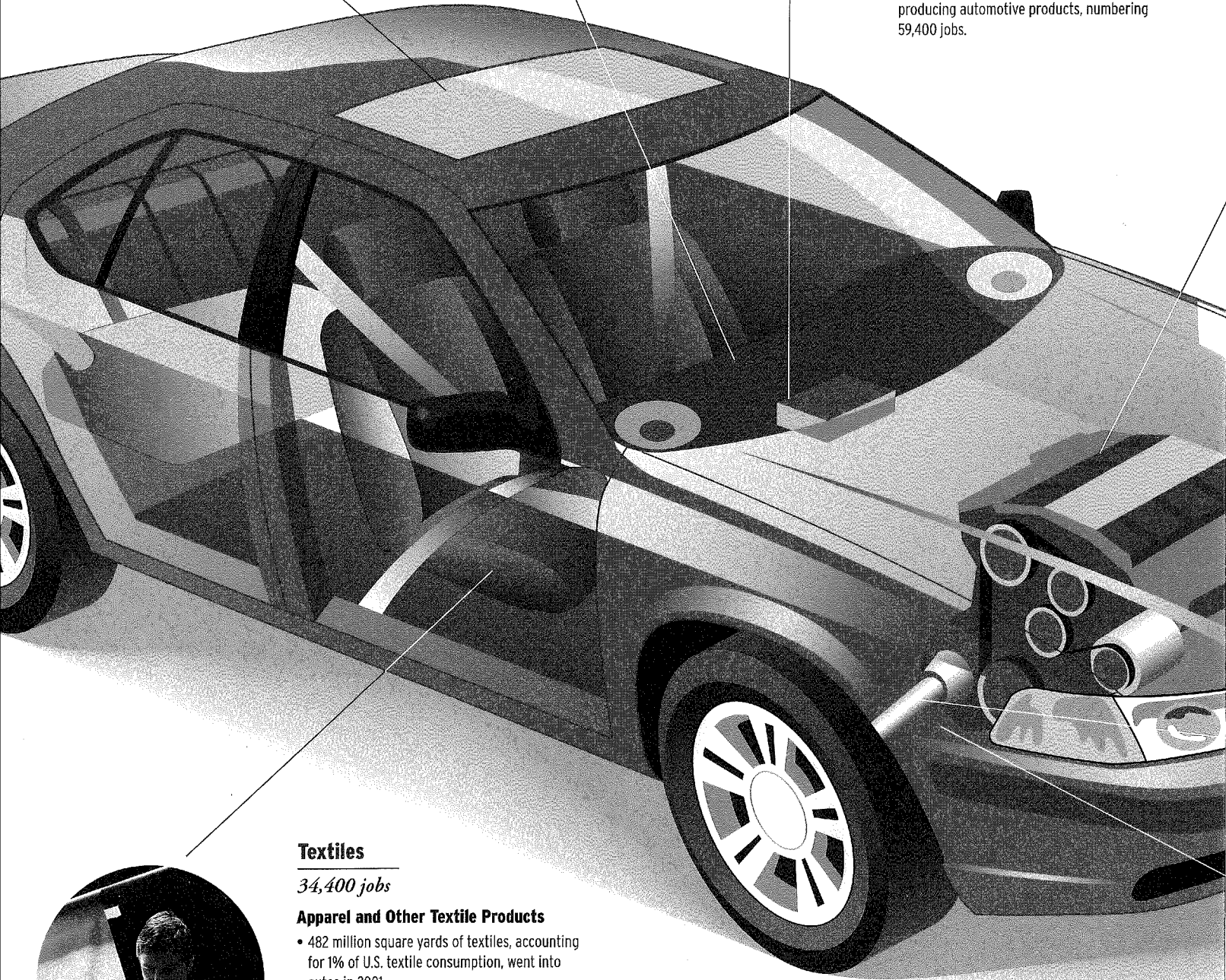
- The U.S. auto industry used more than \$1.2 billion worth of air conditioning systems in 2001.



Electronics

59,400 jobs

- The average vehicle contains between 40 and 50 microprocessors.
- Vehicles sold in the U.S. contained about \$2.4 billion worth of computer chips in 1998, or about \$154 worth of chips per vehicle.
- 7.6% of the component value (not including assembly cost) of the average U.S.-produced automobile is comprised of electronic content, representing a total of \$12.4 billion in 2000 and amounting to about \$970 per vehicle.
- In 1998, 3% of all U.S. workers employed in the electronics industry were engaged in producing automotive products, numbering 59,400 jobs.



Textiles

34,400 jobs

Apparel and Other Textile Products

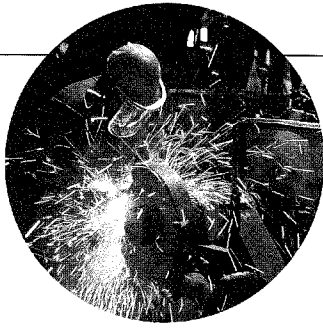
- 482 million square yards of textiles, accounting for 1% of U.S. textile consumption, went into autos in 2001.
- In 1998, 4% of all U.S. workers employed in apparel and other textile products manufacturing industries were engaged in producing automotive products, numbering 34,400 jobs.



Metal Manufacturing

240,200 jobs

- In 1998, 8% of all U.S. workers employed in primary metals manufacturing industries were engaged in producing automotive products, numbering 59,100 jobs.
- In 1998, 12% of all U.S. workers employed in fabricated metal products manufacturing industries were engaged in producing automotive products, numbering 181,100 jobs.



Machinery and Equipment

78,500 jobs

- In 1998, 4% of all U.S. workers employed in industrial machinery and equipment manufacturing industries were engaged in producing automotive products, numbering 78,500 jobs.

Steel

15,475 jobs

- In 2001, the typical auto contained 1,781 pounds of steel, or 41% of the vehicle's weight.
- 14,059,000 tons of steel, accounting for 14% of U.S. steel consumption, went into autos in 2001.
- Adjusted for imports, the auto industry's use of steel provided 15,475 jobs in the U.S. steel industry in 2000.

Zinc

- In 2001, the typical car contained 11 pounds of zinc, or less than 1% of the vehicle's weight.
- 241,500 tons of zinc, accounting for 23% of U.S. zinc consumption, went into autos in 2001.

Auto Repair

678,600 jobs

Auto Parts

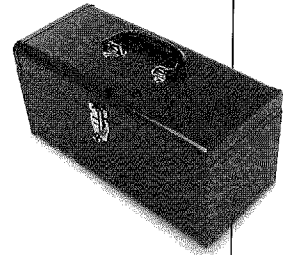
334,566 jobs

Car Washes

137,700 jobs

Maintenance, Repair, Rental, and Parking

- 678,600 people were employed at 142,372 auto repair establishments.
- 334,566 people were employed at 42,519 automotive parts and accessories stores.
- 142,664 people were employed at 17,288 tire dealerships.
- 137,700 people were employed at 13,683 car washes.
- 143,800 people were employees of auto rental companies.
- 80,900 people were employed as parking employees.



Road Construction

289,000 jobs

- 289,000 people were employed by the road and highway construction industry.

Recycling

46,000 jobs

- 14 million motor vehicles were scrapped in 2000, creating a thriving business in salvaging useful parts from autos.
- 95% of scrapped autos are recycled, with 75% of the materials salvaged for re-use.
- 46,000 people were employed at 6,000 recycling businesses.



Aluminum

25,859 jobs

- In 2001, the typical auto contained 256.5 pounds of aluminum, or 8% of the vehicle's weight.
- 3,946,208 tons of aluminum, accounting for 31.6% of U.S. aluminum consumption, went into autos in 2001.
- Adjusted for imports, the auto industry's use of aluminum provided 25,859 jobs in the U.S. aluminum industry in 2000.

Copper and Brass

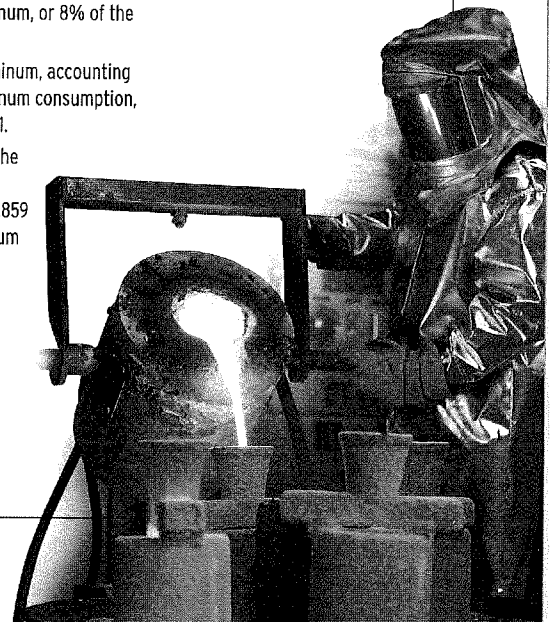
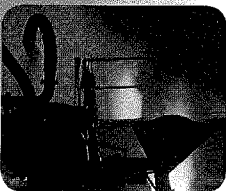
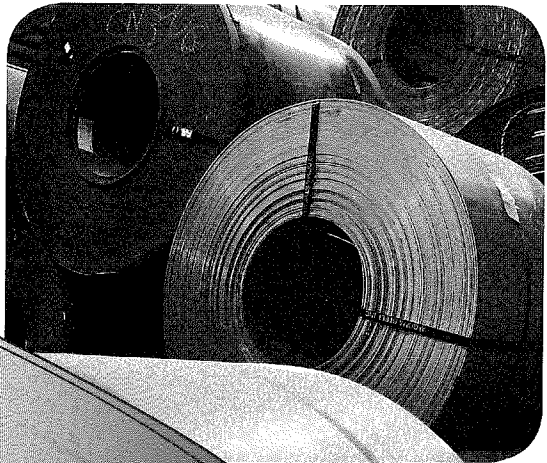
1,393 jobs

- In 2001, the typical car contained 46 pounds of copper and brass, or 1% of the vehicle's weight.
- 737 million pounds of copper, accounting for 9% of U.S. copper consumption, went into autos in 2001.
- Adjusted for imports, the auto industry's use of copper provided 1,393 jobs in the U.S. copper industry in 2000.

Iron

3,384 jobs

- In 2001, the typical auto contained 345 pounds of iron, or 10% of the vehicle's weight.
- 3,075,000 tons of iron, accounting for 31.4% of U.S. iron consumption, went into autos in 2001.
- Adjusted for imports, the auto industry's use of iron provided 3,384 jobs in the U.S. iron industry in 2000.





The U.S. Auto Industry:
13.3 million jobs and \$243 billion in annual paychecks.

America's automobile industry is the largest manufacturing industry in the U.S., and no other single industry is more linked to U.S. manufacturing or generates more retail business and employment. New vehicle production, sales, and other jobs related to the use of automobiles are responsible for 1 out of 10 jobs in the U.S. economy. A lot of U.S. industry goes into every automobile.

Americans are passionate about automobiles of all kinds, from sports cars to pickup trucks, from minivans to SUVs, to all sizes of passenger cars. So naturally, most Americans think of automakers when they think of the automotive industry. **But there's a lot more to the auto industry than automakers.**

CAR
CENTER FOR AUTOMOTIVE RESEARCH

The Center for Automotive Research

is an independent non-profit research and conference organization focusing on the continuing viability of the international automobile industry in North America.



Alliance OF AUTOMOBILE MANUFACTURERS®

The Alliance of Automobile Manufacturers

is a trade association of 9 car and light truck manufacturers including BMW Group, DaimlerChrysler, Ford Motor Company, General Motors, Mazda, Mitsubishi Motors, Porsche, Toyota and Volkswagen.

One out of every 10 jobs in the U.S. is dependent on the automotive industry.

No other industry is linked to so much U.S. manufacturing or generates more retail business and employment.

For more information, visit the Alliance website at www.autoalliance.org.

BMW Group

DAIMLERCHRYSLER



PORSCHE TOYOTA



The Alliance of Automobile Manufacturers

1401 Eye Street, NW, Suite 900 Washington, DC 20005 (202) 326-5500

CAR

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BMW Group

DAIMLERCHRYSLER



PORSCHE

TOYOTA



The Alliance of Automobile Manufacturers

1401 Eye Street, NW, Suite 900 Washington, DC 20005 (202) 326-5500

1 Senator Vickerman from the Committee on Agriculture,
2 Veterans and Gaming, to which was referred

3 S.F. No. 4: A bill for an act relating to agriculture;
4 increasing minimum ethanol content required for gasoline sold in
5 the state; amending Minnesota Statutes 2004, sections 239.761,
6 subdivision 4; 239.791, subdivision 1; 296A.01, subdivisions 2,
7 25.

8 Reports the same back with the recommendation that the bill
9 be amended as follows:

10 Delete everything after the enacting clause and insert:

11 "Section 1. Minnesota Statutes 2004, section 239.791,
12 subdivision 1, is amended to read:

13 Subdivision 1. [MINIMUM ETHANOL CONTENT REQUIRED.] (a)
14 Except as provided in subdivisions 10 to 14, a person
15 responsible for the product shall ensure that all gasoline sold
16 or offered for sale in Minnesota must contain at least 10.0
17 percent denatured ethanol by volume.

18 (b) For purposes of enforcing the minimum ethanol
19 requirement of paragraph (a), a gasoline/ethanol blend will be
20 construed to be in compliance if the ethanol content, exclusive
21 of denaturants and permitted contaminants, comprises not less
22 than 9.2 percent by volume and not more than 10.0 percent by
23 volume of the blend as determined by an appropriate United
24 States Environmental Protection Agency or American Society of
25 Testing Materials standard method of analysis of alcohol/ether
26 content in motor fuels.

27 (c) This subdivision expires on January 1, 2012, if
28 subdivision 1a is effective on that date.

29 Sec. 2. Minnesota Statutes 2004, section 239.791, is
30 amended by adding a subdivision to read:

31 Subd. 1a. [MINIMUM ETHANOL CONTENT REQUIRED.] (a) Except
32 as provided in subdivisions 10 to 14, on January 1, 2012, and
33 thereafter, a person responsible for the product shall ensure
34 that all gasoline sold or offered for sale in Minnesota must
35 contain at least 20 percent denatured ethanol by volume.

36 (b) For purposes of enforcing the minimum ethanol
37 requirement of paragraph (a), a gasoline/ethanol blend will be
38 construed to be in compliance if the ethanol content, exclusive
39 of denaturants and permitted contaminants, comprises not less

1 than 18.4 percent by volume and not more than 20 percent by
2 volume of the blend as determined by an appropriate United
3 States Environmental Protection Agency or American Society of
4 Testing Materials standard method of analysis of alcohol content
5 in motor fuels.

6 (c) This subdivision expires on December 31, 2010, if by
7 that date the commissioner of agriculture certifies and
8 publishes the certification in the State Register that at least
9 20 percent of the volume of gasoline sold in the state is
10 denatured ethanol.

11 Sec. 3. [239.7911] [PETROLEUM REPLACEMENT PROMOTION.]

12 Subdivision 1. [PETROLEUM REPLACEMENT GOAL.] The petroleum
13 replacement goal of the State of Minnesota is that at least 20
14 percent of the liquid fuel sold in the state is derived from
15 renewable sources by December 31, 2015.

16 Subd. 2. [PROMOTION OF RENEWABLE LIQUID FUELS.] (a) The
17 commissioner of agriculture, in consultation with the
18 commissioners of commerce and the pollution control agency,
19 shall identify and implement activities necessary for the
20 widespread use of renewable liquid fuels in the state.
21 Beginning November 1, 2005, and continuing through 2015, the
22 commissioners, or their designees, shall work with
23 representatives from the renewable fuels industry, petroleum
24 retailers, refiners, automakers, small engine manufacturers, and
25 other interested groups, to develop annual recommendations for
26 administrative and legislative action.

27 (b) The activities of the commissioners under this
28 subdivision shall include, but not be limited to:

29 (1) developing recommendations for incentives for retailers
30 to install equipment necessary for dispensing renewable liquid
31 fuels to the public;

32 (2) obtaining federal approval for the use of E20 as
33 gasoline;

34 (3) developing recommendations for ensuring that motor
35 vehicles and small engine equipment have access to an adequate
36 supply of fuel;

1 (4) working with the owners and operators of large
2 corporate automotive fleets in the state to increase their use
3 of renewable fuels; and

4 (5) working to maintain an affordable retail price for
5 liquid fuels.

6 **[EFFECTIVE DATE.]** This section is effective the day
7 following final enactment."

8 Delete the title and insert:

9 "A bill for an act relating to agriculture; increasing
10 minimum ethanol content required for gasoline sold in the state;
11 establishing a petroleum replacement goal; amending Minnesota
12 Statutes 2004, section 239.791, subdivision 1, by adding a
13 subdivision; proposing coding for new law in Minnesota Statutes,
14 chapter 239."

15 And when so amended the bill do pass. Amendments adopted.
16 Report adopted.

.....
(Committee Chair)

17
18
19
20 January 12, 2005.....
21 (Date of Committee recommendation)

Seck, Jerry L.

From: Seck, Jerry L.
Sent: Wednesday, January 12, 2005 9:53 AM
To: 'dallas@senate.mn'
Cc: 'sen.jim.vickerman@senate.mn'; 'sen.gary.kubly@senate.mn'
Subject: Minnesota's Ethanol Industry

MEMORANDUM

To: Senator Dallas Sams
From: Jerry Seck
Re: Existing and Future Ethanol Plants in Minnesota
Date: January 12, 2005

* * * * *

You have asked for information regarding the size, permitted production capacity, and capital investment of Minnesota's existing and future ethanol plants. Here is the information requested:

A. Existing Plants: (Location, Permitted Production Capacity, and Capital Investment)

1. Buffalo Lake
19 mg/yr
\$25 million
2. Winnebago
46.3 mg/yr
\$37 million
3. Preston
50 mg/yr
\$45 million
4. Winthrop
35 mg/yr
\$36 million
5. Morris
21.5 mg/yr (permit application into MPCA for 30 mg/yr)
\$23 million
6. Benson
49.5 mg/yr
\$49 million
7. Bingham Lake
35 mg/yr
\$34 million
8. Claremont
34.9 mg/yr
\$42 million
9. Little Falls
22 mg/yr

\$33 million

10. Albert Lea
50 mg/yr
\$46 million
11. Luverne
22 mg/yr
\$21 million
12. Marshall
37 mg/yr
\$40 million

TOTAL: 422.2 MG/YR
COST: \$431 MILLION

B. New plants -- under construction; in MPCA permitting process; or proposed:

1. Lake Crystal, MN (under construction)
50 mg/yr
Cost: \$70 million +/-
2. Granite Falls, MN (under construction)
45 mg/yr
Cost: \$70 million +/-
3. Atwater, MN (under construction)
50 mg/yr
Cost: \$70 million +/-
4. Heron Lake, MN (in MPCA permitting process)
55 mg/yr
Cost: \$90 million +/-
5. Welcome, MN (proposed)
100 mg/yr
Cost: \$125 million +/-

TOTAL: 300 MG/YR
COST: \$325 MILLION +/-

(Note: These cost estimates are just my guesses.)

C. Existing and New Plants by 2006:

Minnesota ethanol production: 722.2 mg/yr
Capitol cost of Minnesota's ethanol plants: \$756 million

Estimated annual purchase of goods and services by
Minnesota's existing and new plants by year 2006: \$750 million

Gerald L. Seck
Larkin Hoffman Daly & Lindgren Ltd
1500 Wells Fargo Plaza
900 Xerxes Avenue South
Minneapolis, MN 55431

Dir. Dial: (952) 896-3205
Fax: (952) 842-1737
Email: jseck@larkinhoffman.com
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JO ANNE ZOFF SELLNER
DIRECTOR

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State of Minnesota

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LEGISLATIVE ANALYSTS

DAVID GIEL
GREGORY C. KNOPFF
MATTHEW GROSSER
DANIEL L. MUELLER
JACK PAULSON
CHRIS L. TURNER
AMY M. VENNEWITZ
MAJA WEIDMANN

S.F. No. 4 - As Amended by the Delete-Everything Amendment (SCS0004A-1)

Author: Senator Dallas C. Sams

Prepared by: Greg Knopff, Legislative Analyst *gk*
phone: 651-296-9399 fax: 651-296-7747
e-mail: gregory.knopff@senate.mn

Date: January 12, 2005

The first part of the bill increases the minimum ethanol requirement in gasoline to 20 percent on January 1, 2012. This new 20 percent requirement will sunset on December 31, 2010, if by that date the Commissioner of Agriculture finds that 20 percent of the overall volume of gasoline sold in Minnesota is ethanol.

The second part of the bill establishes a goal for the State of Minnesota to have 20 percent of all liquid fuel sold in the state from renewable sources by 2015. The bill directs the Commissioner of Agriculture, in consultation with the Commissioner of the Pollution Control Agency and the Commissioner of Commerce, to identify and implement activities to promote the use of renewable liquid fuels to make the goal.

Section 1 [Technical Amendment] provides an expiration date for the current 10 percent ethanol requirement, if the 20 percent ethanol requirement is effective on January 1, 2012.

Section 2 [20 Percent Ethanol Requirement] increases the minimum ethanol requirement in gasoline to 20 percent on January 1, 2012. The 20 percent requirement will sunset on December 31, 2010, if by that date the Commissioner of Agriculture finds that 20 percent of the overall volume of gasoline sold in Minnesota is ethanol.

Section 3 [Petroleum Replacement Promotion]

Subdivision 1. [Petroleum Replacement Goal] creates a petroleum replacement goal for Minnesota of 20 percent of all liquid fuel sold to be from renewable sources by December 31, 2015.

Subdivision 2. [Promotion of Renewable Liquid Fuels] directs the Commissioner of Agriculture, in consultation with the Commissioner of the Pollution Control Agency and the Commissioner of Commerce, to identify and implement activities to promote the use of renewable liquid fuels. The activities must include:

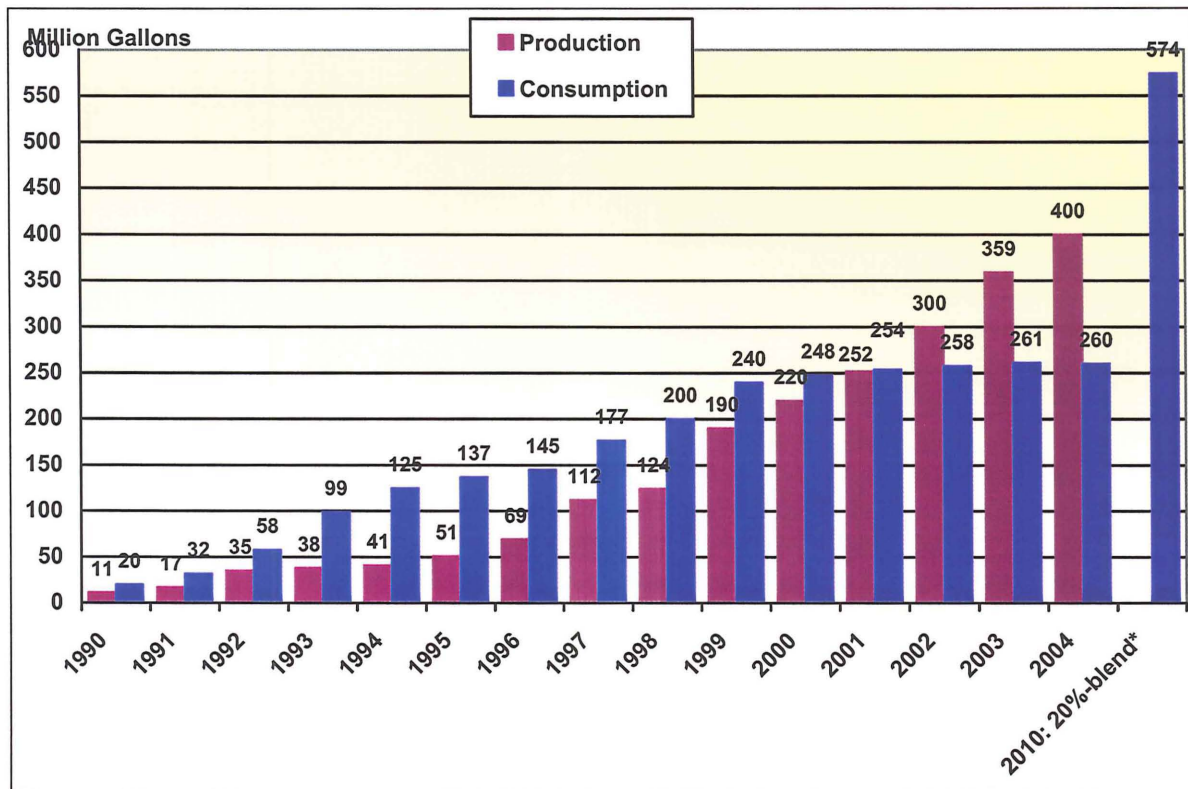
- (1) recommendations for incentives for installation of renewable liquid fuel dispensing equipment;
- (2) obtaining federal approval for the use of 20 percent ethanol;
- (3) recommendations for ensuring access to an adequate fuel supply for motor vehicles and small engine equipment;
- (4) working with owners and operators of large corporate automotive fleets to increase their use of renewable fuels; and
- (5) working to maintain an affordable retail price for fuels.

GK:dv

Minnesota Ethanol: Production, Consumption, and Economic Impact

- Minnesota annually produces 400 million gallons of ethanol from 14 plants. About 260 million gallons are consumed in the state and the rest – 140 million gallons or 35% of Minnesota's total annual ethanol production – is exported.
- To meet the requirement of 20%-blend ethanol in all gasoline sold in Minnesota by 2010 as proposed by Governor Pawlenty, Minnesota would need 574 million gallons of ethanol. (This number is based on projected annual gasoline consumption growth trends from 2004 to 2010.)
- The proposed 20%-blend would require Minnesota to increase its ethanol production by 174 million gallons by 2010, about 44% increase over the current production level. The three new ethanol plants currently under construction have a combined production capacity of 150 million gallons, which would come into production by the end of calendar year 2005. That would bring Minnesota's ethanol production capacity to 550 million gallons five years before the 20%-blend implementation.
- Minnesota's ethanol industry generates an estimated \$1.36 billion in total economic impacts and 5,300 jobs. The proposed 20%-blend ethanol by 2010 is projected to generate a total of \$1.58 billion in economic impacts and 6,157 jobs.

Minnesota Ethanol Production and Consumption



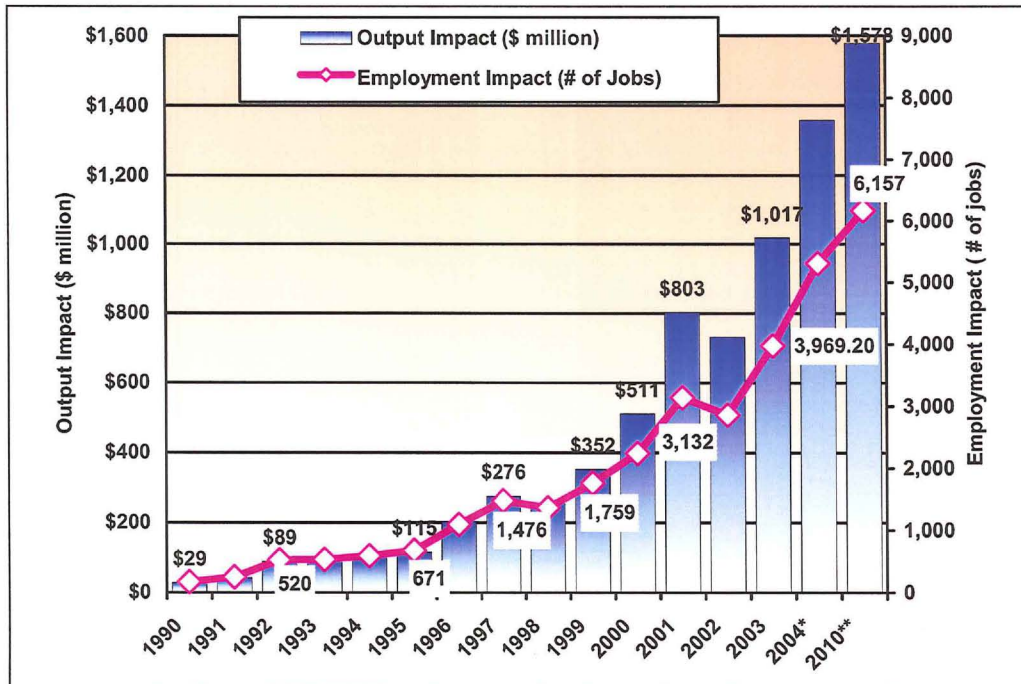
*Estimated consumption based on Gov. Pawlenty's proposed 20%-blend ethanol by 2010.

Source: AMS, MDA

Minnesota Ethanol: Economic Impact

| | Production (Million Gallons) | Output Impact (\$ million) | Employment Impact (# of Jobs) |
|---------------------------|------------------------------------|----------------------------------|-------------------------------------|
| 1990 | 11 | 28.51 | 166 |
| 1991 | 17 | 42.38 | 247 |
| 1992 | 35 | 89.30 | 520 |
| 1993 | 38 | 90.96 | 529 |
| 1994 | 41 | 101.45 | 590 |
| 1995 | 51 | 115.26 | 671 |
| 1996 | 69 | 203.51 | 1,089 |
| 1997 | 112 | 275.66 | 1,476 |
| 1998 | 124 | 254.38 | 1,362 |
| 1999 | 190 | 352.47 | 1,759 |
| 2000 | 220 | 511.48 | 2,231 |
| 2001 | 252 | 802.60 | 3,132 |
| 2002 | 300 | 732.24 | 2,858 |
| 2003 | 359 | 1,017.09 | 3,969 |
| 2004* | 400 | 1,358.05 | 5,300 |
| 2010 (20%-blend)** | 574 | 1,577.68 | 6,157 |

Minnesota Ethanol: Output Impact & Employment Impact



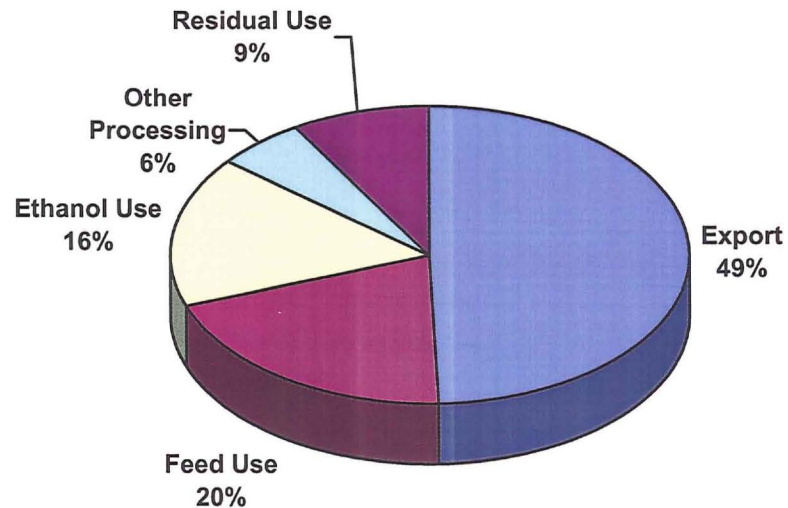
*Projected **Estimates based on Gov. Pawlenty's proposed 20%-blend ethanol by 2010

Source: AMS, MDA

Minnesota Ethanol: Corn Utilization

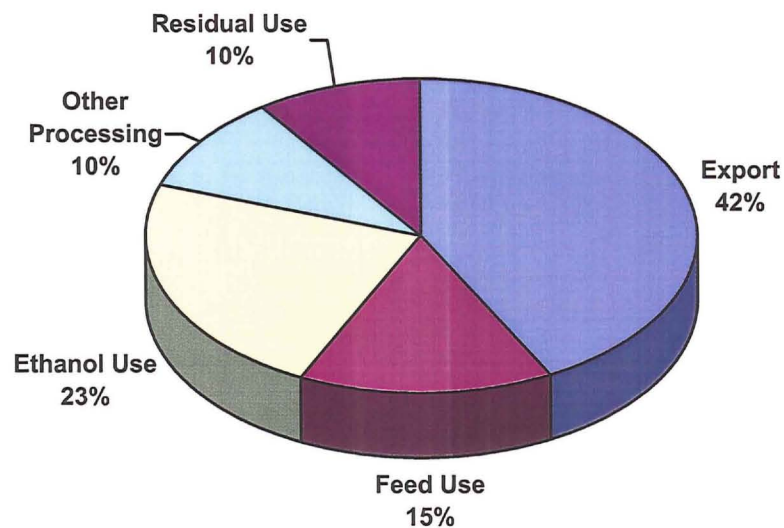
- In 2004, about 160 million bushels of corn was processed into ethanol, or one-sixth of Minnesota's total annual corn crop.
- By 2010, the proposed 20%-blend ethanol would require 230 million bushels of corn. If Minnesota's corn production remains at around 1 billion bushels per year, that would be about a quarter of the annual crop.

MN Corn Utilization (2004)



Source: PRX and MDA

MN Corn Utilization (2010 Projection*)



*Based on PRX data and MDA estimates

"Attachment I"

January 12, 2005

To: Members of the Minnesota Senate Agriculture, Gaming and Veteran Affairs Committee

Dear Senators,

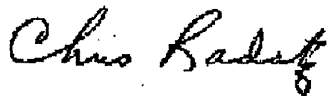
Minnesota Farm Bureau public policy strongly supports the expanded use of renewable fuels in Minnesota and our nation. Expanded use of renewable fuels is one of the priorities our members established for Farm Bureau's legislative activities during the 2005 session. We are very encouraged that increasing renewable fuel usage in Minnesota is one of the first issues your committee is dealing with this year.

Minnesota Farm Bureau staff and leadership are attending the American Farm Bureau Federation Annual Meeting and unable to attend your committee hearing today. We have been successful at the American Farm Bureau level of continuing our policy of increasing the use of renewable fuels.

Farm Bureau public policy supports increasing the amount of ethanol in gasoline sold in Minnesota. We urge you to pass legislation out of your committee today that will move Minnesota towards more usage of ethanol and less dependence on foreign sources of energy.

Thank you for considering our policy in your deliberations today.

Sincerely,



Chris Radatz
Minnesota Farm Bureau Public Policy Team Director

" Attachment K "



Alliance OF AUTOMOBILE MANUFACTURERS

November 30, 2004

The Honorable Tim Pawlenty
Governor's Office
130 State Capitol
St. Paul, Minnesota 55155

Dear Governor Pawlenty:

On behalf of the Alliance of Automobile Manufacturers, I am writing to you regarding your recently announced ethanol proposal. The Alliance of Automobile Manufacturers is a trade association of nine car and light truck manufacturers including BMW Group, DaimlerChrysler, Ford Motor Company, General Motors, Mazda, Mitsubishi Motors, Porsche, Toyota and Volkswagen. More than 111,000 jobs in Minnesota are dependent on the auto industry.

Automakers share your goal in increasing the use of renewable and alternative fuels. Alliance members are working on multiple pathways for advanced technology vehicles. Fuel cell, hybrid electric, clean diesel, hydrogen internal combustion, and alternative fuels are a few of the technologies that manufacturers are now bringing to market. The auto industry has invested billions of dollars in research, development, and deployment of these vehicles.

The Alliance is also doing its part to support ethanol-based fuels. For years, Alliance member companies have been manufacturing "flexible fuel" vehicles (FFVs) with special fuel systems that can operate on fuels with high concentrations of ethanol, up to 85% (E85). We recognize that the use of ethanol enhances energy security by providing an alternative to petroleum fuels. However, we see some difficulties with your proposed ethanol (E20) initiative.

Minnesota law currently requires that gasoline sold in the state must include 10% ethanol (E10). As we understand it, you have proposed requiring that, in the future, Minnesota would double the amount of ethanol in gasoline to 20% (E20). The difficulty with this proposal is that most vehicles on U. S. roads have been designed to use gasoline that contains no more than 10 percent ethanol. Gasoline-powered vehicles are not designed to operate on fuels with higher concentrations of ethanol, such as E20. Moreover, E20 use would create driveability problems and possible mis-detections from the onboard diagnostics (OBD) system, which is critical to the proper functioning of the emission control system. The use of a fuel such as E20 in a typical gasoline-powered vehicle is likely to create numerous problems and alienate consumers.

Moreover, fuels with higher than 10% ethanol content are not considered "gasoline" under federal law. Section 211(f) of the Clean Air Act provides that it is unlawful for manufacturers of fuel or fuel additives to introduce into commerce any fuel or fuel additive for general use in light-duty motor vehicles unless the fuel is "substantially similar" to fuels used in the certification of 1975 or subsequent model year vehicles. Ethanol has never been a component of such fuels. EPA is authorized to waive the application of this provision under certain conditions, and in 1979 it granted a waiver for gasoline containing up to 10% anhydrous ethanol. See 44 FR 20777 (April 6, 1979). EPA has never granted such a waiver for ethanol in higher concentrations than 10%. Therefore, fuel providers may not market E20, or any other ethanol blend higher than E10, for use in gasoline-powered automobiles. Only the FFVs mentioned above, with their unique fuel systems, would be capable of operating on fuels with ethanol concentrations higher than 10%.

**BMW Group • DaimlerChrysler • Ford Motor Company • General Motors
Mazda • Mitsubishi Motors • Porsche • Toyota • Volkswagen**

While there are approximately 4 million such FFVs across the US, E20 would not be compatible with most vehicles on the road today.

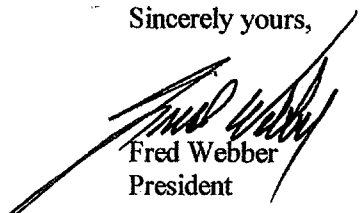
The Alliance does not believe it would be desirable or cost-effective to pursue an increase in the level of ethanol for conventional gasoline. This would require a major effort to re-engineer the fuel systems of all future vehicles, and even then there would still be many vehicles left on the road that are incompatible with a fuel such as E20. A better approach would be to invest in E85 infrastructure and increase the availability of E85 and the demand for FFVs.¹ If E85 were to gain a more substantial foothold in Minnesota's and the nation's fuel markets, this would provide a very distinct alternative to conventional gasoline, and it would be a useful tool in enhancing energy security.

Although E85 infrastructure is growing gradually in Minnesota and other states, it is still not conveniently available to many consumers. In several areas where E85 is available, it costs more than unleaded regular gasoline, which discourages consumers from E85 refueling. Manufacturers have put significant numbers of FFVs on the road, thanks in part to federal incentives designed to encourage FFV availability. Now, obstacles in the production and sale of E85 need to be overcome. The Alliance supports the development of E85 infrastructure in Minnesota as a means of encouraging consumers to purchase FFVs and to ultimately increase the use of ethanol in fuel.

Automakers are committed to working with Minnesota on increasing the use of alternative fuels. We believe that Minnesota can best achieve this goal by increasing the availability of E85 fuel and other alternative fuels, and by helping to incentivize the purchase of the many alternative fuel and advanced technology vehicles currently available. Minnesota can take a leadership role in the effort to reduce our nation's dependence on petroleum by educating consumers, encouraging them to purchase alternative fuel vehicles, and broadening the availability of alternative fuels.

Thank you for your attention to these issues that are of importance to your constituents and our customers. Please feel free to contact me at (202) 326-5577 if you would like to discuss this matter further.

Sincerely yours,



Fred Webber
President

¹ Since FFVs can run on any ethanol blend up to 85% ethanol, policymakers could in theory promote the use of any ethanol blend over 10% (e.g., E20 or E50) in addition to conventional gasoline (not as a replacement for it). However, if the goal is to take maximum advantage of the benefits of ethanol, one would presumably promote E85 production.



Attachment L

John T. Bozzella
Vice President
Public Policy and State Governmental Affairs

One American Road
Dearborn, MI 48126-2798 USA

December 6, 2004

The Honorable Tim Pawlenty
Governor, State of Minnesota
130 State Capitol
75 Rev. Dr. Martin Luther King Jr. Blvd.
Saint Paul, MN 55155

Dear Governor Pawlenty:

Thank you for your recent letter to Bill Ford concerning the use of 20% blended ethanol in vehicles in the Minnesota market.

We share your vision of reducing petroleum consumption in the U.S. and thereby improving our nation's energy security. Renewable fuels such as ethanol can be important elements of a strategy to realize that vision, and Ford is committed to helping achieve that goal. For many years our gasoline-powered vehicles have been designed to operate on up to 10 percent ethanol. In addition, over the last decade we have manufactured hundreds of thousands of flexible fuel vehicles (FFVs) that can operate on up to 85 percent ethanol, and we will continue to do so.

Ford is also working hard to develop other advanced technology solutions including hybrid electric, hydrogen, and advanced diesel vehicles. Our new Escape Hybrid is just one example of the technologies we are bringing to the market in an ongoing effort to improve the energy efficiency of our vehicles.

We have considered your request to extend all vehicle warranties to include operation on 20% ethanol. There are several constraints that preclude our ability to do so.

Most vehicles on the road today were designed to use gasoline that contains up to 10 percent ethanol. Because of the way they were designed, operating on fuels with higher concentrations of ethanol, such as E20, may cause performance and fuel system problems that damage materials and hardware and lead to customer dissatisfaction. Only FFVs, with their specially designed systems, would be capable of operating properly on ethanol concentrations above 10%. E20 would therefore not be compatible with most vehicles (non-FFV) on U.S. roads today.

In addition to vehicle concerns, the Clean Air Act's "substantially similar" rule precludes fuel providers from marketing E20, or any other ethanol blend higher than E10, for use in gasoline-powered automobiles.



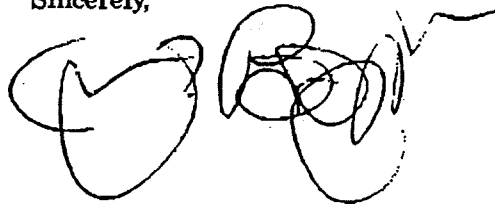
We believe the best approach in promoting the use of ethanol is to further expand the availability of E85 stations in Minnesota to take advantage of the nearly 100,000 FFVs on the state's roads today. Commendably, nearly 100 E85 stations currently exist in Minnesota, more than any other state. However, this represents only 2.5% of the approximately 4,000 refueling stations in Minnesota. More stations are needed to facilitate E85 use at every fill-up for all FFVs. Achieving a high percentage of E85 use by the existing and future FFV fleet would be a significant accomplishment in the effort to reduce petroleum dependency.

In some cases E85 costs more than gasoline and many FFV owners choose the less costly option. Ensuring that E85 is attractively priced will help customers to make the right decision to increase their use of E85.

Ford is interested in working with Minnesota to increase the use of ethanol through increased availability of E85 to FFV owners. We believe Minnesota can help by utilizing incentives to further expand E85 infrastructure, and considering ways to achieve a more attractive pricing for E85 fuel. In doing so, Minnesota can continue its leadership role in the effort to reduce our nation's dependence on petroleum.

We would be happy to meet with your staff to explore ways to achieve expanded use of E85.

Sincerely,

A handwritten signature in black ink, appearing to be a stylized name, possibly "Ford".



Pine Bend Refinery

Proposal to Increase the Ethanol Mandate

Legislative Testimony – Diane Koebele

January 12, 2005

P.O. Box 64596
Saint Paul, Minnesota 55164
651.437.0700

"Attachment M"

Flint Hills Resources opposes raising the ethanol mandate to 20 percent for several reasons:

Increasing the ethanol blend in gasoline will further reduce gas mileage.

- Ethanol blended gasoline gets less mileage – 3 to 5 percent less at 10 percent ethanol and 6 to 10 percent less at 20 percent ethanol.
- Decreased gas mileage will cost consumers more.

Blending ethanol with gasoline has some negative environmental impacts.

- Ethanol use decreases some emissions, but raises others. Studies by the California Air Resources Board show that blending ethanol with gasoline increases smog-forming emissions, specifically nitrogen oxide (NOx). The state should understand the environmental impact of increasing the ethanol mandate to 20 percent.
- A voluntary group, Clean Air Minnesota, has formed to decrease both NOx and volatile organic compound (VOC) emissions, which contribute to the formation of smog. The state should examine the impact this proposal will have on NOx emissions.

Current automobile warranties do not cover engine problems that could result from using fuel blended with more than 10 percent ethanol.

- Automobile manufacturers publish fuel recommendations in their vehicle owners' manuals. A 2003 survey shows that ethanol content above 10 percent is not a recommended fuel for standard automotive engines.

If refiners and retailers are forced to sell gasoline blended with 20 percent ethanol and auto manufacturers won't warranty engines for the fuel, then the state should provide liability protection for refiners and retailers in the event of engine problems.

Currently, it is not legal to sell gasoline blended with more than 10 percent ethanol.

- Minnesota will need a federal government waiver under the Clean Air Act before gasoline blended with 20 percent ethanol can be sold in Minnesota.

Gasoline stations may have to add pumps and underground storage tanks if the ethanol mandate is increased to 20 percent, which could significantly increase their costs.

- Some proposals call for 20 percent ethanol content by 2010 or when 50 percent of the auto manufactures will warranty engines for fuel with 20 percent ethanol in it.
- Retailers could potentially have to offer both 10 and 20 percent ethanol blends since the mandate could go into effect even though not all new or used car engines would have a warranty for 20 percent ethanol.
- Offering both blends could require costly infrastructure changes that would hurt small retail gasoline station owners.

FUEL PERMEATION FROM AUTOMOTIVE SYSTEMS

Final Report

CRC Project No. E-65

September 2004

Prepared for:

California Environmental Protection Agency



Air Resources Board

1001 I Street - Sacramento, California 95814

and



Coordinating Research Council, Inc.
3650 Mansell Road, Suite 140 - Alpharetta, Georgia 30022

Conclusions, Findings and Recommendations

Conclusions - Based on the results of this study, and subject to all the limitations of the project plan and scope, the following can be concluded:

1. Gasoline containing ethanol at a level of 2.0 weight percent oxygen increased the permeation of the tested California vehicle systems, compared to gasoline with MTBE as the oxygenate at the same oxygen content, or a similar gasoline made without any oxygenate; these changes in emissions were statistically significant at the 95% level for the diurnal data. The non-oxygenated fuel did not produce a statistically significant change in permeation relative to the MTBE fuel. (Page 39)
2. Non-ethanol hydrocarbon permeation emissions generally increased when the ethanol containing fuel was tested. (Pages 51-52)
3. The average specific reactivities of the permeate from the three test fuels were similar. The specific reactivities of the permeate of the MTBE and ethanol fuels (Fuels A and B) were not statistically different on average. The non-oxygenated fuel (Fuel C) permeate was higher than the other two with a statistically significant difference. (Pages 44-50)
4. Permeation rates measured at different temperatures followed the relationship predicted in the literature, nominally doubling for a 10° C rise in temperature. (Pages 53-55)
5. A consistent relationship between the 105°F steady-state permeation rate and the variable temperature 24-hour diurnal permeation rate was observed on all three fuels. (Page 56)
6. Vehicles certified to the newer "enhanced" evaporative emission standards (phased in from the 1996 to 1998 model years) had lower permeation emissions, including those with non-metallic fuel tanks. (Pages 39-40)
7. The non-metallic fuel tank systems of the early 1990s (Rigs 5 and 6) exhibited relatively high permeation emissions on all test fuels compared to the other systems tested. (Pages 39-40)
8. Permeation rates from the two newest non-metallic fuel tank systems (Rigs 2 and 4) exhibited a sensitivity to fill level. The emissions were lower when there was less fuel in the tank. (Page 59)
9. Permeation emissions (105°F steady-state) generally approached a stabilized level within 1 to 2 weeks when switching from one fuel to another. (Page 37)

Findings -

1. The average increase of the diurnal permeation emissions was 1.40 g/day for the ethanol fuel compared to the MTBE fuel (Fuel B compared to Fuel A). The individual rig increases ranged from 0.34 to 2.71 g/day. (Appendix G - Page 78)

2. The average increase of the diurnal permeation emissions was 1.10 g/day for the ethanol fuel compared to the non-oxygenated fuel (Fuel B compared to Fuel C). The individual rig increases ranged from -0.15 to 2.90 g/day. (Appendix G – Page 78)
3. The average specific reactivities (MIR – g Potential Ozone/g VOC) of the permeate emissions from the three fuels, and the 95% multiple comparison limits about those averages were found to be (Page 49):

| | |
|---------------------|--------------|
| MTBE Fuel | 3.47 ± 0.107 |
| Ethanol Fuel | 3.27 ± 0.102 |
| Non-Oxygenated Fuel | 3.66 ± 0.075 |

4. The average 105°F steady-state permeation rates ranged from 9.4 to 801 milligrams per hour (mg/hour) on the ten rigs and the three tested fuels. (Page 53)
5. The ratios between the 85 and 105°F permeation rates, on average, were (Page 54):

| | |
|---------------------|------|
| MTBE Fuel | 0.42 |
| Ethanol Fuel | 0.46 |
| Non-Oxygenated Fuel | 0.46 |

Recommendations – *It is recommended that this study be expanded to assess the newer California LEV II compliant vehicles.* The data and understandings collected during this test program are limited to the in-use fleet vehicles that existed at the time this study was initiated. The California LEV II requirements lowered the evaporative emissions (3-day Diurnal + Hot Soak) limits from 2.0 g/day to 0.5 g/day starting with model year 2004 vehicles. These new technology vehicles should be evaluated in the same fashion as was done in this study

It is also recommended that a similar study be done on E10 fuel. While the data were collected at ethanol levels currently used in California (5.7%), ethanol is commonly used at 10% in other parts of the country.

Test Program Overview

The objective of this test program was to measure the permeation emissions of California compliant gasolines containing ethanol, MTBE, or no oxygenate, in vehicle systems representative of the California in-use fleet as it existed in calendar year 2001.

A test fleet of 10 vehicles was chosen. ATL procured the vehicles for testing from California retail sources, brought the vehicles to the laboratory in Arizona, and carefully inspected the vehicles to insure that the original fuel system was present and in good repair. After passing this initial inspection, the lab personnel removed the entire fuel system intact (without making any disconnections to the liquid or vapor system), and fabricated an aluminum rack or “rig” that held the components in their approximate x, y and z positions.

Each test rig was filled with test fuel and stored in a test room at 105°F until evaporative testing determined that stabilization of the permeation emissions was achieved. Each rig had the fuel in it circulated twice a week, and all fuel was drained and fresh fuel was installed every seventh

State of California
AIR RESOURCES BOARD

**Comparison of the Effects of a Fully-Complying Gasoline
Blend and a High RVP Ethanol Gasoline Blend on Exhaust
and Evaporative Emissions**

November 1998

Prepared by:

Mobile Source Control Division
Mobile Source Operations Division
Monitoring and Laboratory Division
Stationary Source Division
Technical Support Division

Reviewed by:

Bob Cross, Chief, Mobile Source Control Division
Rod Summerfield, Chief, Mobile Source Operations Division
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Peter D. Venturini, Chief, Stationary Source Division
Terry McGuire, Chief, Technical Support Division

This report has been prepared by the staff of the Air Resources Board. Publication does not signify that the contents reflect the views and policies of the Air Resources Board, nor does mention of trade names constitute endorsement or recommendation for use.

ACKNOWLEDGMENTS, Continued

Staff want to thank the members of the Ethanol Workgroup, whose help in defining the scope of the program and resolving technical issues has been invaluable.

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Systems Applications International

I. EXECUTIVE SUMMARY

A. Overview

This report presents the results of a test program conducted by the Air Resources Board (ARB) on 12 light-duty vehicles. The test program was initiated in late 1995, to investigate whether a 10 percent ethanol (3.5 weight percent oxygen) gasoline blend with an 8.0 psi Reid vapor pressure (RVP) would provide as good or better emission benefits as a fully complying gasoline blended to be typical of the gasoline used during the summer and meeting a 7.0 psi RVP limit. The purpose of the program is to determine whether an RVP exemption should be provided to 10 percent ethanol blends as provided for in Health and Safety Code Section 43830(g).

To compare the emission effects of these two gasoline blends, 12 vehicles were tested for exhaust emissions on the federal test procedure (FTP) and REPO5 (off-cycle) test procedure¹. The vehicles were model year 1990-1995 light-duty vehicles with 3-way catalysts and fuel-injection. These control technologies were introduced in 1981 vehicles and by 1986 almost all new vehicles had these technologies. The 1986 and newer model year vehicles account for about 70 percent of the projected vehicle miles traveled for 1998 and a significant fraction of the emissions in the emissions inventory for light duty vehicles.

Six of the vehicles were also tested for evaporative emissions. Evaporative emissions tests were based on ARB's procedures for the 2-day diurnal and standard 1-hour hot-soak tests. Tests for running loss emissions were not performed because the running loss test facilities were not available at the time. Running loss emissions were estimated with the assistance of General Motors using their vapor generation model². ARB staff also estimated running loss emissions using a draft ARB model for evaporative emissions and the U.S. EPA's model for evaporative emissions.

B. Results

Exhaust and evaporative emissions test data were evaluated for the following: carbon monoxide (CO), oxides of nitrogen (NOx), total hydrocarbons (THC), nonmethane organic gas species (NMOG), ozone-forming potential from NMOG (OFP), ozone-forming potential from NMOG plus carbon monoxide (OFPCO), sum of toxic masses (TOX), and potency-weighted toxics (TOXPW). The four toxic compounds evaluated under this test program include benzene, 1,3-butadiene, formaldehyde, and acetaldehyde.

The data were evaluated to address the following specific questions.

¹ The REPO5 is a test procedure that provides information on how vehicle emission control systems perform at high speeds. For more details refer to the "Final Technical Report on Aggressive Driving Behavior for the Revised Federal Test Procedure, Notice of Proposed Rulemaking. U.S. EPA, Office of Air and Radiation, Office of Mobile Sources, January 31, 1995.

² The GM model is proprietary and has not been described in detail in any publication. The Model is based on principles described in SAE Paper No. 861556, "Evaporative Emissions from Gasolines and Alcohol-Containing Gasolines with Closely Matched Volatilities," by S. R. Reddy, October 1986.

- How do the regulated (THC, CO and NO_x) emissions and NMOG emissions from the high RVP ethanol blend compare to those from the fully complying blend?
- How does the ozone forming potential of the emissions from the high RVP ethanol blend compare to that from the fully complying blend?
- How do the emissions of toxic compounds from the high RVP ethanol blend compare to those from the fully complying blend?

The test results were evaluated using arithmetic averages (percent of the means and mean of percents methods) and a more formal statistical methodology to provide a comprehensive examination of the data. The arithmetic averages represent a simple assessment of the data to estimate general trends. The formal method represents a rigorous statistical evaluation of the data that provides refined estimates and allows for evaluation of statistical significance.

The overall percent change in emissions (combined effects of exhaust and evaporative processes) was calculated based on the percent of the means, mean of percents, and the formal methods. Also, individual test modes were examined. *(See Appendix 3 for more discussion on the statistical methodology.)*

A summary of the overall percent change in emissions using each of the methodologies is presented in the following table. As shown in the table, all three methodologies give similar results in the estimate of the percent change in emissions between the high RVP ethanol blend and the complying blend.

The formal method indicates that CO emissions decreased by about 10 percent for the high RVP ethanol blend while NO_x emissions increased by 14 percent. For combined exhaust and evaporative emissions, THC increased by 18 percent. Also, combined NMOG emissions were 32 percent higher for the high RVP ethanol blend than for the complying blend.

The results were also assessed for ozone forming potential by performing a reactivity adjusted emissions analysis. We used the Carter maximum incremental reactivity (MIR) factors³ to calculate the ozone forming potential of both the exhaust and evaporative emissions. The ozone forming potential of the combined exhaust and evaporative emissions is 21 percent higher for the high RVP ethanol blend than for the complying blend. The difference in ozone forming potential is largely due to the higher RVP of the ethanol blend which results in significantly greater evaporative NMOG mass emissions.

³ California Non-Methane Organic Gas Test Procedures, Amended June 24, 1996, Monitoring and Laboratory Division, California Air Resources Board.

Table 1
Overall Percent Change in Emissions
(High RVP Ethanol Blend vs. Complying Blend)

| Pollutant | Analysis Method | | |
|------------------------------------|------------------|-----------------|----------------|
| | Percent of Means | Mean of Percent | Formal Method* |
| Exhaust Only | | | |
| CO | -7% | -7% | -10% |
| NO _x | 17% | 16% | 14% |
| Exhaust and Evaporative Combined** | | | |
| THC | 23% | 21% | 18% |
| NMOG | 35% | 35% | 32% |
| OFP | 20% | 23% | 21% |
| OFPCO*** | 16% | 19% | 17% |
| TOX | 14% | 15% | 13% |
| TOXPW | 9% | 6% | 5% |

* The estimated percent changes under the formal method have likelihoods of 90 percent or higher. For the estimates of percent change based on the arithmetic averages (simple analysis) we don't estimate likelihoods.

** Running loss emissions were estimated using evaporative emissions models.

*** Includes CO as an other species. See Appendix 3 for details of how CO is integrated into the ozone forming potential.

Note: A positive number indicates that there was an increase in emissions associated with using the ethanol blend. A negative number indicates the opposite; emissions using the ethanol blend were lower.

While CO is generally not included in a reactivity adjusted emissions analysis, any reduction in CO could benefit the exhaust emissions by somewhat reducing the ozone forming potential. However, evaporative emissions are not affected by CO. When CO is included, the ozone forming potential is 17 percent higher for the high RVP ethanol blend than for the complying blend.

Although not shown in Table 1, the specific reactivity, which is a measure of how much ozone would be formed per gram of NMOG, was similar for the high RVP ethanol blend and the complying blend. This was expected given that both test blends were made from the same gasoline base and about equal volumes of oxygenate were added.

Exhaust emissions of the toxic compounds—benzene, 1, 3-butadiene, formaldehyde and acetaldehyde emissions from the high RVP ethanol and complying blends were evaluated on both a mass and cancer potency adjusted basis. The combined emissions of toxics are 13 percent greater for the high RVP ethanol blend than for the complying blend. Also, the combined potency weighted toxics are five percent greater for the high RVP ethanol blend than for the complying blend.

C. Results of Data Evaluation

In general, the results of the test program are consistent with those previously reported in studies conducted to evaluate the effect of oxygen and RVP on exhaust and evaporative emissions.⁴ The data show that the high RVP ethanol blend has a greater ozone forming potential than a fully complying blend even when the additional CO benefits and reactivity are incorporated.

The data collected in this test program show that the high RVP ethanol blend produces lower CO emissions than the complying blend. The data also show that NO_x emissions increase significantly for the high RVP ethanol blend. The evaporative emissions data clearly show that the RVP level has an important effect on mass emissions. While evaporative emissions are less reactive than exhaust, the one psi RVP increase from splash blending ethanol results in significantly higher mass emissions of THC and NMOG and associated ozone forming potential.

The results show that there is a likelihood between 90 to 100 percent that emissions of NO_x, THC, toxics, and potency weighted toxics are greater with the high RVP ethanol blend than with the fully complying gasoline. The data also show that the likelihood is greater than 95 percent that the ozone forming potential is higher with the high RVP ethanol blend than with the fully complying gasoline. However, for CO, the likelihood is almost 100 percent that emissions are higher with the fully complying gasoline than with the high RVP ethanol blend.

D. Conclusions

In conclusion, the data from the twelve vehicles in the test program indicate that a high RVP ethanol blend significantly increases overall emissions of NO_x, THC, NMOG, ozone forming potential, toxics, and potency weighted toxics, and decreases emissions of CO. Additionally, the high level of certainty associated with the results of the test program show that additional testing would not likely change the outcome of this evaluation and that additional testing on 1990 to 1995 model year vehicles and vehicles that employ control technologies similar to these are unnecessary.

⁴ See references 1 through 4.