ROUNDABOUTS—THEY ARE NOT COMPLICATED

IN VERMONT, MOST BUSY INTERSECTIONS REQUIRE ONLY THE SAFEST SINGLE LANE ROUNDABOUT, AND MOST SIGNALS CAN BE CONVERTED TO SINGLE LANE ROUNDABOUTS

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BEFORE THE ADDISON COUNTY REGIONAL PLANNING COMMISSION TRANSPORTATION ADVISORY COMMITTEE

OCTOBER 16, 2013

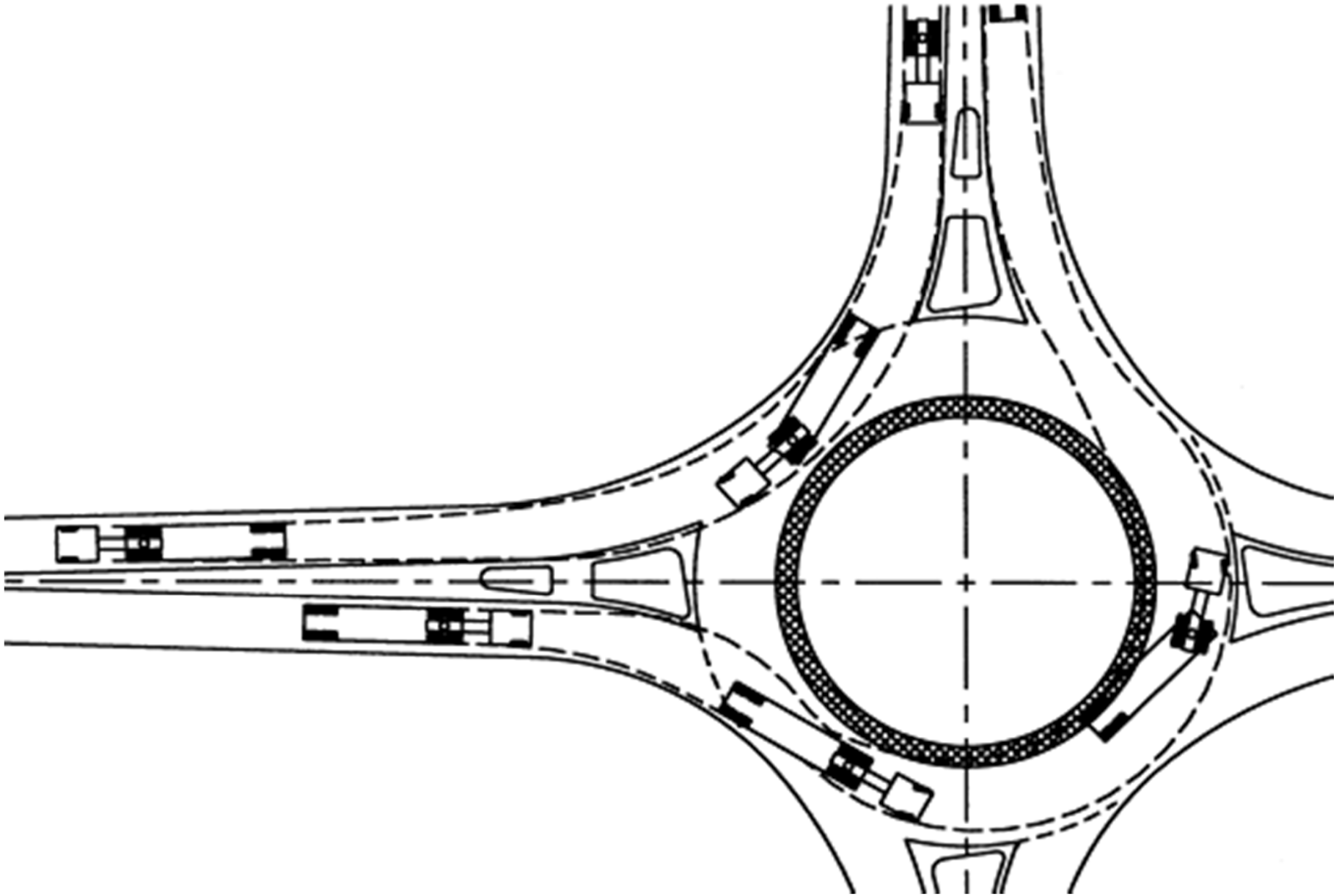
VERMONT'S FIRST ROUNDABOUT CORRIDOR—MANCHESTER CENTER 2012

PART OF THE 1995 PLAN, LAST NOVEMBER THE SECOND AND THIRD ROUNDABOUT ON MAIN STREET COMPLETED THE "TOP OF THE T" PLAN, INCLUIDNG REPLACING "MALFUNCTION JUNCTION" WITH THE NEW "FUNCTION JUNCTION" AT MAIN AND DEPOT STREETS ALONG WITH THE FIRST VERMONT "MINI-ROUNDABOUT" ABOUT 150 FEET AWAY IN FRONT OF THE FIRST BAPTIST CHURCH, THE JUNCTION OF VT 7A/VT 30.

VERMONT NOW HAS TWO TRULY WALKABLE CORRIDORS, MAIN STREET, MANCHESTER CENTER AND BURLINGTON'S FIVE BLOCK CHURCH STREET MARKET PLACE—FOR WALKERS BOTH CONTAIN THE HIGHEST LEVEL OF SAFETY AND THE LOWEST DELAY. WALKABLE NODES EXIST AT OTHER URBAN ROUNDABOUTS, INCLUDING MIDDLEBURY.


ROUND-A-BOUT
Café
bakery • deli • restaurant

DEFLECTION—KEY TO SAFETY



A ROUNDABOUT IS NOT: (1) A ROTARY OR (2) A TRAFFIC CIRCLE

- "ROTARY" IS ANOTHER WORD FOR TRAFFIC CIRCLE
- A TRAFFIC CIRCLE IS LARGE—TYPICALLY 300 TO 1,000 FEET IN DIAMETER VERSUS THE TYPICAL URBAN SINGLE LANE ROUNDBOUT OF 90 FEET TO 130 FEET (MIDDLEBURY 120 FEET IN DIAMETER)
- A TRAFFIC CIRCLE HAS NO "DEFLECTION" SO BOTH ENTERING AND CIRUCLATING SPEEDS ARE MUCH HIGHER OFTEN ABOUT 30-40 MPH—STILL A TRAFFIC CIRCLE DOES AS WELL IN SAFETY ON AVERAGE AS A SIGNAL WHEN INJURY SEVERITY IS CONSIDERED
- A ROUNDABOUT BY DESIGN HAS A MAXIMUM DESIGN SPEED WITH URBAN ROUNDABOUTS SERVING WALKERS (SINGLE LANE) WITH MAXIMUM SPEED DESIGN LEVEL OF 5-15 MILES AN HOUR

TRAFFIC CIRCLE HISTORY

- IDEA FOR MOVING TRAFFIC IN A CIRCLE FROM PARIS CITY PLANNER EUGENE HENARD IN LATE 19TH CENTURY
- FIRST "TRAFFIC CIRCLE" AT COLUMBUS CIRCLE IN NEW YORK CITY 1904 LED BY US TRAFFIC MANAGEMENT AND RULES PIONEER WILLIAM PHELPS ENO
- SECOND TRAFFIC CIRCLE, PARIS, PLACE D'TOILLE, NOW PLACE CHARLES DEGAULLE (WITH ARCH DE TRIOMPHE IN CENTER ISLAND) 1907
- THIRD TRAFFIC CIRCLE IN 1909 IN ENGLISH NEW TOWN OF LETCHWORTH


October 2000
220 ft Dia. Roundabout

TRAFFIC CIRCLE EPOCH—1905-1966

- TRAFFIC CIRCLES, AKA ROTARIES, WERE POPULAR IN NEW ENGLAND NEW YORK/NEW JERSEY/PENNSYLVANIA UNTIL WW II, THEN GENERALLY ABANDONED BECAUSE OF LACK OF CAPACITY AS TRAFFIC INCREASED THEY LOCKED UP SOLID AT SATURATION
- 1966 U.K. YIELD-AT-ENTRY RULE ADOPTION AROSE FROM FINDING PRIORITY FOR TRAFFIC INSIDE THE CIRLE LED TO HIGHER CAPACITY AND LOWER CRASH RATES WITH DEFLECTION AT ENTRY CONSTRAINING VEHICLES FROM PAST PRACTICE OF HIGH SPEED ENTRY—THUS ENDED THE FIVE DECADE ERA OF THE TRAFFIC CIRCLE AND THE BEGINNING OF THE MODERN ROUNDABOUT ERA

MODERN ROUNDABOUT NUMBERS

FRANCE LEADS WITH ABOUT 33,000 ROUNDABOUTS

THE UK ROUNDABOUT NUMBERS ABOUT 10,000

MELBORNE HAS OVER 5,000 ROUNDABOUTS (INCLUDING RESIDENTIAL TRAFFIC CALMING CIRCLES)

THE U.S. AND CANADA ABOUT 3,500 ROUNDABOUTS—FIRST U.S. ROUNDABOUTS AT LAS VEGAS IN 1990. IF THE US BUILT AT THE 1993-2003 FRENCH RATE: 7,000 ROUNDABOUTS YEARLY

FIRST NORTHEASTERN ROUNDABOUT (NORTH OF MARYLAND AND EAST OF LAS VEG): KECK CIRCLE, MONTPELIER, VT 1995, TWO BLOCKS FROM STATE/MAIN INTERSECTION. VERMONT TOTAL TODAY: 11.

CARMEL, IN, 70,000 POPULATION WITH FREEWAY EXITS NOW TWO-THIRDS THE WAY TO BEING A 100 ROUNDABOUT-ONE SIGNAL TOWN THROUGH THE LEADERSHIP OF MAYOR JAMES BRAINARD.

ROUNDABOUT SAFETY

- US INSURANCE INSTITUTE FOR HIGHWAY SAFETY 2000 STUDY FOUND A REDUCTION OF “SERIOUS” AND “FATAL” INJURIES OF “ABOUT 90%” AT U.S. ROUNDABOUTS

- WITH ABOUT 3,500 US AND CANADIAN ROUNDABOUTS BUILT SINCE 1990 AND ABOUT 15,000 ROUNDABOUT YEARS NOW RECORDED, NOT A SINGLE WALKER FATALITY OCCURRED; AND ONLY ONE DOCUMENTED BICYCLIST FATALITY WHICH OCCURERED ON PARTIALLY CONVERTED MUTI-LANE TRAFFIC CIRCLE IN LONG BEACH, CA

WALKER SAFETY

WALKER SAFETY AT INTERSECTIONS

FROM HIGHEST TO LOWEST

1. 1. SHARED SPACE/SINGLE-LANE ROUNDABOUT WITH TRAFFIC CALMING (CHURCH STREET MARKETPLACE, EXAMPLED OF SHARED SPACE)
2. 2. SINGLE LANE OR MINI ROUNDABOUT
3. 3. TWO-LANE ROUNDABOUT
4. TRAFFIC SIGNAL/SIGNS (NO LONGER EMPLOYED AT BUSY INERSECTIONS IN INCREASING NUMBERS OF JURISDICTIONS)

OTHER ROUNDABOUT BENEFITS

- 1. IMPROVED SCENIC QUALITY WITH SPACE FOR LANDSCAPING/BEAUTIFICATION ON CENTRAL ISLAND
- 2. REDUCTION OF GREENHOUSE GASES, ABOUT A THIRD VERSUS SIGNALS AT BUSY INTERSECTIONS
- 3. INCEREASED CAPACITY OVER SIGNALS AND SHARP DECLINE IN DELAY FOR ALL USERS
- 4. REDUCED FUEL CONSUMPTION AND POLLUTANTS—ABOUT A THIRD VERSUS SIGNALS AT BUSY INTERSECTIONS (ABOUT 20,000 GALLONS YEARLY AT INTERSECTIONS WITH DAILY ENTERING VOLUMES OF 25,000 LIKE THE BRATTLEBORO KEENE TURN)
- 5. LOWER MAINTENANCE COSTS, ELECTRICITY COSTS, IMPROVED SOCIAL INTERACTION
- 6. ENABLES INCREASED DEVELOPMENT DENSITIES, CONSTRAINS SRAWL
- 7. TRAFFIC CALMS ABOUT TWO BLOCK OUTWARD ON EACH LEG

U.S. WALKING AND BIKE MODES URBAN TRIPS SHARE VS GERMANY AND THE NETHERLANDS

- US WALKING AND BICYCLING SHARE OF URBAN TRIPS: 6% (5% WALKING, 1% BICYCLING)
- TYPICAL WESTERN EUROPEAN WALK BIKE TRIPS SHARE: WALKING 24% AND BICYCLING 10%
- AVERAGING SHARES FOR THE NETHERLANDS AND GERMANY: 23% WALK, 20% BICYCLE (COPENHAGEN GOAL, 50% OF ALL TRIPS BY BIKE BY 2015)
- U.S. FATALITY RATES PER MILE OF TRAVEL VERSUS AVERAGE OF GERMAN AND DUTCH: 2.6 TIMES FOR WALKING MODE AND 4 TIMES FOR BIKING MODE

WALKING MODE SAFETY: 1-LANE ROUNDABOUTS

1. BEST ESTIMATE OF SAFETY—A 75 TO 90 PERCENT REDUCTION OF INJURY AND FATALITY RATES FOR WALKING MODE AVERAGE FOR A ROUNDABOUT VERSUS SIGNED/SIGNALED INTERSECTION. THE SWEDISH (75% REDUCTION) AND DUTCH (90% REDUCTION) STUDIES COME FROM NATIONS WITH FAR HIGHER LEVELS OF WALKING THAN THE U.S. AND CANADA.

2. 2. YOU ARE 2.6 TIMES AS LIKELY TO DIE PER MILE OF WALKING IN THE U.S. THAN GERMANY OR THE NETHERLANDS. AND IT IS NOT BECAUSE WE BUILD UNSAFE SIDEWALKS—IT IS OUR INTERSECTIONS THAT MOSTLY GENERATE HIGH FATALITY RATE DIFFERENTIAL.

3. FOR URBAN ROUNDABOUTS WITH A DIAMETER OF 100-110 FEET, THE **DESIGN SPEED MAXIMUM IS 10-15 MPH** AT 0-10 MPH, VEHICLES YIELD TO WALKERS ABOUT 100% OF THE TIME AND WHEN CRASHES OCCUR INJURIES ARE LESS SEVERE. ALL STUDIES SHOW WALKER FATALITIES INCREASE WITH INCREASING SPEEDS—ROUNDABOUTS REDUCE SPEEDS AT AND NEAR INTERSECTIONS

AARP IDENTIFIES INTERSECTIONS A TARGET OR OLDER CITIZEN FATALITY REDUCTION

- IN WALKER INTERSECTION CRASHES ONE IN FIVE OF THOSE AGED OVER 75 DIE, OF THOSE UNDER UNDER 14 JUST ONE OF TWELVE DIE (FHWA)
- ABOUT A THIRD OF ALL WALKER FATALITIES OCCUR AT INTERSECTIONS, FOR THOSE OVER 65 THE PERCENTAGE ALMOST DOUBLES TO 59% (336 FATALITIES IN 2003) (FHWA)
- WHILE OVERALL HIGHWAY FATALITIES DECLINED FROM ITS PEAK ABOUT A DECADE AGO, WALKER FATALITIES CONTINUE TO INCREASE (FHWA)
- WHILE A QUARTER OF ALL HIGHWAY FATALITIES OCCUR AT INTERSECTIONS, AARP REPORTS “HALF OF ALL OLDER DRIVER DEATHS OCCUR AT INTERSECTIONS.” (AARP Brief 167 number 2009-2)

OLDER DRIVERS AND INTERSECTION CRASHES

Forty percent of all crashes that involve drivers over the age of 65 occur at intersections. This is nearly twice the rate of experienced younger drivers.

FEDERAL HIGHWAY ADMINISTRATION

AARP ENDORSES ROUNDABOUTS

“Roads can be reengineered for slower speeds through changes to curb radii, lane widths, or replacement of typical intersections with roundabouts (*emphasis added).*”

-- AARP references from Brief 167 number 2009-2

BICYCLE MODE SAFETY: 1-LANE ROUNDABOUTS

- 1. SINGLE LANE ROUNDABOUTS—REGARDLESS OF DESIGN—REDUCE BICYCLE INJURIES BY 60-75% BASED ON SWEDISH AND DUTCH STUDIES.
- 2. HOWEVER, IF A ROUNDABOUT PROVIDES A SEPARATE OR SHARED PATHWAY FOR THE BICYCLIST, INJURY REDUCTIOINS REACH NEAR THE 90% REDUCTION LEVEL FOUND FOR WALKER INJURY REDUCTION. (NOTE THE NY 9 PATHED ROUNDABOUT AT THE SOUTH EDGE OF PLATTSBURGH).
- 3. ON/OFF RAMPING FOR BICYCLES WHICH IS JUST BECOMING COMMON NOW IS BEING SUPERSEEDED BY PATHING.
- 4. CYCLE TRACK—PROTECTED BIKE LANES—ALSO RUSHING INTO PRACTICE WHEN COMBINED WITH "PATHED" ROUNDAOUTS BECOMES THE NEW GOLD STANDARD OF BICYCLE SAFETY DESIGN ENABLING ALL—REGARDLESS OF SKILL OR AGE—TO TRAVEL SAFELY BY BICYCLE.

HIGH SPEED INTERSECTIONS—40 MPH AND OVER

WHILE ALL INTERSECTIONS QUALIFY FOR AND BENEFIT FROM ROUNDABOUT DESIGN, THE ONLY SENSIBLE CHOICE FOR HIGH SPEED INTERSECTIONS—40 MPH AND ABOVE—IS THE ROUNDABOUT. CROSS INTERSECTIONS OF HIGH SPEED EXPERIENCE THE VERY DEADLY T-BONE CRASHES WITH HIGH PROBABILITIES OF SERIOUS INJURY AND DEATH RESULTING—AS DID EVEN THE T-SIGNED INTERSECTION OF US 7 AND FERRISBURGH STATE HIGHWAY WITH THE TRIPLE FATALITY OF THREE YOUNG FOLKS ONE SUNNY SPRING AFTERNOON A FEW YEARS AGO IN VERGENNES.

STATE/PROVINCIAL AND FEDERAL LAWS AND POLICIES

- 1. THANKS TO NOW GOVERNOR SHUMLIN, THEN A STATE SENATOR ON THE TRANSPORTATION COMMITTEE, VERMONT PASSED THE FIRST STATE STATUTE REQUIRING CONSIDERATION OF ROUNDABOUTS AT DANGEROUS INTERSECTIION FOR SAFETY PURPOSES IN 2003.

- SEN. JAMES JEFFORDS GETS RECOGNITION FOR PLACING THE WORD "ROUNDABOUT" FOR THE FIRST TIME IN FEDERAL TRANSPORTATION LAW IN 2004. THAT LAW NOW ALLOWS ROUNDABOUTS ELIGIBLE AMONG THE "SAFETY" ITEMS FOR 100% FEDERAL SHARE IN STATES PROJECTS.

- NEW YORK STATE DEPT. OF TRANSPORTATION ADOPTED IN 2005 A "ROUNDABOUTS ONLY" POLICY NOW IN PLACE IN VIRGINIA AND FLORIDA. BRITISH COLUMBIA FOLLOWED BY ALBERTA ADOPTED STRONG ROUNDABOUTS ONLY POLICIES AT THE PROVINCIAL LEVEL LAST DECAE.

“THE ONLY GOOD ARGUMENT AGAINST ROUNDABOUTS IS THERE ARE NO GOOD ARGUMENTS”

- --BARRY S. CROWN, U.K. ROUNDABOUT EXPERT PRACTIONER AND SOFTWARE AUTHOR, AND INITIAL ROUNDABOUT DESIGN ADVISOR TO THE NY STATE STATE AND NEW HAMPSHIRE DEPARTMENTS OF TRANSPORTATION

- “THE ROUNDABOUT IS THE SAFETY BELT OF INTERSECTIONS”

- “THE ROUNDABOUT IS THE NEW TECHNOLOGY OF INTERSECTION TREATMENT BUILT WITH STONE AGE MATERIALS”

- “THE ROUNDABOUT IS SOMETHING GOOD THAT YOU CAN DO FOR YOUR COMMUNITY”

TONY REDINGTON