## BCA: Summary of Project Benefits and Costs

| Project Years | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 |
|---------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Safety        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 1 - Current 10,000 crashes will be reduced due to safety countermeasures incorporated into the design. (Discounting applied) | $1,818,066 | $1,499,625 | $1,151,007 | $865,002 | $599,007 | $437,005 | $302,005 | $206,005 | $141,005 | $99,005 | $80,005 | $63,005 | $50,005 | $40,005 | $33,005 | $28,005 | $24,005 | $20,005 | $18,005 | $16,005 |
| 2 - Safer walking and biking infrastructure will lead to more walking and biking due to existing latent demand for these activities by both residents and visitors. (Qualitative) | $160,386 | $149,893 | $140,087 | $130,922 | $122,357 | $114,353 | $106,872 | $99,880 | $93,346 | $87,239 | $81,532 | $76,198 | $71,213 | $66,554 | $62,200 | $58,131 | $54,328 | $50,774 | $47,452 | $44,348 |
| Economic Competitiveness Benefits | $123,872,356 | | | | | | | | | | | | | | | | | | | |
| 3 - One-time net increase in land value (Commercial) (Discounting applied) | $9,588,043 | $9,588,043 | $9,588,043 | $9,588,043 | $9,588,043 | $9,588,043 | $9,588,043 | $9,588,043 | $9,588,043 | $9,588,043 | $9,588,043 | $9,588,043 | $9,588,043 | $9,588,043 | $9,588,043 | $9,588,043 | $9,588,043 | $9,588,043 | $9,588,043 | $9,588,043 |
| Environmental Sustainability | $113,174 | | | | | | | | | | | | | | | | | | | |
| 6 - Reduction in vehicle emissions (air pollution) due to reduction of VMT (Discounting applied) | $6,219 | $11,712 | $16,823 | $15,866 | $15,019 | $14,485 | $13,490 | $12,669 | $11,970 | $11,310 | $10,098 | $9,541 | $8,915 | $8,517 | $8,048 | $7,604 | $7,185 | $6,709 | $6,414 |
| 7 - Water quality is improved due to stormwater filtration and groundwater recharge through the use of bioswales. (Qualitative) | $9,588,043 |
| 8 - Carbon capture is increased through the planting of medians with trees. (Qualitative) | $17,195,235 |
| 9 - The roadway's heat island effect is reduced through tree planting (Qualitative) | $113,174 |
| Quality of Life | | | | | | | | | | | | | | | | | | | |
| 10 - Personal transportation costs are reduced by being able to walk, bike, or take transit to work. (Qualitative) | | | | | | | | | | | | | | | | | | | |
| 11 - Health is improved by incorporating physical activity into daily life through active transportation. (Qualitative) | | | | | | | | | | | | | | | | | | | |
| 12 - Stress is reduced for all roadway users by having safer streets for all modes of transportation. (Qualitative) | | | | | | | | | | | | | | | | | | | |
| Operating Cost Savings | $7,866,758 | | | | | | | | | | | | | | | | | | | |

*Project Costs (without discounting) total of $22,626,000, which includes a requested $20,363,400 in BUILD funding and a local match of $2,262,600. Discounting is applied to the costs above.

<p>| Total Selection Criteria (Discounting Applied) | $1,818,066 |
| Total Selection Criteria | $133,770,335 |
| Project Costs | $20,181,961 |
| Total Benefits | $113,588,374 |
| Total Cost | $20,181,961 |
| Net Benefits | $113,588,374 |</p>
<table>
<thead>
<tr>
<th>HEADING</th>
<th>DESCRIPTION</th>
<th>VALUES</th>
</tr>
</thead>
<tbody>
<tr>
<td>REPORT NO</td>
<td>report number</td>
<td>None</td>
</tr>
<tr>
<td>DATE OCCUR</td>
<td>date</td>
<td>Month/Day/Year ( dashes)</td>
</tr>
<tr>
<td>OCCUR TIME</td>
<td>time</td>
<td>Hour/Military entry based on military time (24:00)</td>
</tr>
<tr>
<td>OCCUR DAY</td>
<td>day</td>
<td>Su = Sunday, M = Monday, Tu = Tuesday, W = Wednesday, Th = Thursday, F = Friday, Sa = Saturday</td>
</tr>
<tr>
<td>MV TOT</td>
<td># of motor vehicles involved</td>
<td>1, 2, 3, etc.</td>
</tr>
<tr>
<td>MC TOT</td>
<td># motorcycles involved</td>
<td>1, 2, 3, etc.</td>
</tr>
<tr>
<td>MOP TOT</td>
<td># mopeds involved</td>
<td>1, 2, 3, etc.</td>
</tr>
<tr>
<td>BC TOT</td>
<td># bicycles involved</td>
<td>1, 2, 3, etc.</td>
</tr>
<tr>
<td>PED TOT</td>
<td># pedestrians killed</td>
<td>1, 2, 3, etc.</td>
</tr>
<tr>
<td>NO. INJURED</td>
<td># pedestrians injured</td>
<td>1, 2, 3, etc.</td>
</tr>
<tr>
<td>PRIM ROUTE NO</td>
<td>primary roadway route number</td>
<td>None (no coding)</td>
</tr>
<tr>
<td>PRIM NAME</td>
<td>primary roadway name</td>
<td>None (no coding)</td>
</tr>
<tr>
<td>PRIM MILE POST</td>
<td>primary roadway milepost</td>
<td>None (no coding)</td>
</tr>
<tr>
<td>REFER DIST FT</td>
<td>crash distance from reference</td>
<td>Distance given in feet (to the nearest foot)</td>
</tr>
<tr>
<td>REFER DIST MILE</td>
<td>crash distance from reference</td>
<td>Distance given in miles (to the nearest tenth of a mile)</td>
</tr>
<tr>
<td>REFER DIRECT FROM</td>
<td>crash direction from reference</td>
<td>N = North, E = East, S = South, W = West</td>
</tr>
<tr>
<td>REFER NAME</td>
<td>reference name</td>
<td>None</td>
</tr>
<tr>
<td>LOC HARMFUL EVENT</td>
<td>location of first harmful event</td>
<td>INTERSECTION/JUNCTION, OFF ROADWAY OTHER, ON ROADWAY NOT AT INTERSECTION, OTHER ROADWAY</td>
</tr>
<tr>
<td>EVNT 01 ACTION</td>
<td>1st harmful event, action</td>
<td>NON-COLLISION, COLLISION WITH PERSON (PED ACTION), COLLISION WITH BICYCLE OR MOPED, COLLISION WITH OTHER, COLLISION WITH OBJECT/ANIMAL, COLLISION WITH MOTOR VEHICLE IN TRANSIT, COLLISION WITH M/S/TRANSIT, WALL, RAIL, OTHER</td>
</tr>
<tr>
<td>INTERSECT</td>
<td>intersection</td>
<td>01 = No, 02 = Yes</td>
</tr>
<tr>
<td>CRASH SEVERITY</td>
<td>greatest injury severity</td>
<td>00 = None, 01 = Possible, 02 = Non-Incapacitating, 03 = Incapacitating, 04 = Fatal, 05 = Unknown</td>
</tr>
</tbody>
</table>

**ACCIDENT REPORT LEGEND**

**VALUES**

### EVENT 01 ACTION

<table>
<thead>
<tr>
<th>Event</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>WORK COLLISION</td>
<td>COLLISION WITH PERSON (PED ACTION)</td>
</tr>
<tr>
<td>01</td>
<td>Overturn/Rollover on Roadway</td>
</tr>
<tr>
<td>02</td>
<td>Overturn/Rollover off Roadway</td>
</tr>
<tr>
<td>03</td>
<td>Submergence</td>
</tr>
<tr>
<td>04</td>
<td>Fire/Explosion</td>
</tr>
<tr>
<td>05</td>
<td>Jackknife</td>
</tr>
<tr>
<td>06</td>
<td>Rain on Roadway</td>
</tr>
<tr>
<td>07</td>
<td>Cargo/Equipment Loss or Shift</td>
</tr>
<tr>
<td>08</td>
<td>Fall from/Riding from Motor Vehicle</td>
</tr>
<tr>
<td>09</td>
<td>Overhead/Railway Capacity</td>
</tr>
<tr>
<td>10</td>
<td>Separation of Units</td>
</tr>
<tr>
<td>11</td>
<td>Cross Median/Crosswalk</td>
</tr>
<tr>
<td>12</td>
<td>Equipment Failure</td>
</tr>
<tr>
<td>13</td>
<td>Thrown or Falling Objects</td>
</tr>
<tr>
<td>14</td>
<td>Other Non-Collision (Specify)</td>
</tr>
<tr>
<td>15</td>
<td>COLLISION WITH BICYCLE OR MOPED</td>
</tr>
<tr>
<td>16</td>
<td>COLLISION WITH OBJECT/ANIMAL</td>
</tr>
<tr>
<td>17</td>
<td>COLLISION WITH M/S/TRANSIT</td>
</tr>
<tr>
<td>18</td>
<td>WALL, RAIL, OTHER</td>
</tr>
<tr>
<td>TRANSPORT</td>
<td>COLLISION WITH MOTOR VEHICLE IN TRANSIT</td>
</tr>
<tr>
<td>19</td>
<td>Stuck</td>
</tr>
<tr>
<td>20</td>
<td>Bridge, Overhead Structure</td>
</tr>
<tr>
<td>21</td>
<td>Ridge Rail, Support</td>
</tr>
<tr>
<td>22</td>
<td>Bridge Rail</td>
</tr>
<tr>
<td>23</td>
<td>Foundation</td>
</tr>
<tr>
<td>24</td>
<td>Shield</td>
</tr>
<tr>
<td>25</td>
<td>Other Non-Collision (Specify)</td>
</tr>
</tbody>
</table>

### INTERSECT

<table>
<thead>
<tr>
<th>Intersection</th>
</tr>
</thead>
<tbody>
<tr>
<td>01 = No</td>
</tr>
<tr>
<td>02 = Yes</td>
</tr>
</tbody>
</table>

### CRASH SEVERITY

<table>
<thead>
<tr>
<th>Injury Severity</th>
</tr>
</thead>
<tbody>
<tr>
<td>00 = None</td>
</tr>
<tr>
<td>01 = Possible</td>
</tr>
<tr>
<td>02 = Non-Incapacitating</td>
</tr>
<tr>
<td>03 = Incapacitating</td>
</tr>
<tr>
<td>04 = Fatal</td>
</tr>
<tr>
<td>05 = Unknown</td>
</tr>
</tbody>
</table>
## Estimated Crash Reduction Benefits on Poipu Road by Crash Modification Factor

### 2006-2012

<table>
<thead>
<tr>
<th>Number of Accidents</th>
<th>15</th>
<th>6</th>
<th>3</th>
<th>5</th>
<th>9</th>
<th>1</th>
<th>15</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>7-year (2006-2012) Value of Injuries</td>
<td>$1,669,456.48</td>
<td>$323,658.72</td>
<td>$192,139.20</td>
<td>$16,174.08</td>
<td>$1,154,118.14</td>
<td>$125,049.89</td>
<td>$899,500.61</td>
<td>$3,560,596.51</td>
</tr>
<tr>
<td>Yearly average Value of Injuries</td>
<td>$241,350.93</td>
<td>$46,236.96</td>
<td>$27,448.46</td>
<td>$2,310.58</td>
<td>$164,874.02</td>
<td>$17,884.27</td>
<td>$128,500.09</td>
<td>$500,085.22</td>
</tr>
</tbody>
</table>

### Estimated Crash Reduction

<table>
<thead>
<tr>
<th>CMF ID</th>
<th>Name</th>
<th>CMF</th>
<th>CRF (1-CMF)</th>
</tr>
</thead>
<tbody>
<tr>
<td>207</td>
<td>Conversion of stop-controlled intersection into single-lane roundabout</td>
<td>0.42</td>
<td>0.58</td>
</tr>
<tr>
<td>3034</td>
<td>Install Raised Median</td>
<td>0.61</td>
<td>0.39</td>
</tr>
<tr>
<td>7840</td>
<td>Install Bicycle Lanes</td>
<td>0.42</td>
<td>0.58</td>
</tr>
<tr>
<td>6362</td>
<td>Widened Shoulder</td>
<td>0.8</td>
<td>0.2</td>
</tr>
<tr>
<td>6356</td>
<td>Widened Shoulder</td>
<td>0.93</td>
<td>0.07</td>
</tr>
<tr>
<td>9240</td>
<td>Install Sidewalk</td>
<td>0.41</td>
<td>0.59</td>
</tr>
</tbody>
</table>

### Estimated Yearly Crash Reduction Benefits

- **2020**: $196,479
- **2021**: $160,386
- **2022**: $149,893
- **2023**: $140,087
- **2024**: $130,922
- **2025**: $122,357
- **2026**: $114,353
- **2027**: $106,872
- **2028**: $99,880
- **2029**: $93,346
- **2030**: $87,239
- **2031**: $81,532
- **2032**: $76,198
- **2033**: $71,213
- **2034**: $66,554
- **2035**: $62,200
- **2036**: $58,131
- **2037**: $54,328
- **2038**: $50,774
- **2039**: $47,452
- **2040**: $44,348

### Yearly Average Value of Injuries

| Yearly Average Value of Injuries | $3,929,585 | $1,818,066 |

### FV = PV / (1 + i)^t

- **FV** = Future value of payment in real dollars (i.e., dollars that have the same purchasing power as in the base year of the analysis, see the next section for further discussion on this topic) in year **t**
- **i** = Real discount rate applied (7%)
- **t** = Years in the future for payment (where base year of analysis is **t = 0**)

In accordance with OMB Circular A-94, applicants to the discretionary grant program should use a real discount rate (the appropriate discount rate to use on monetized values expressed in real terms, with the effects of inflation removed) of 7 percent per year to discount streams of benefits and costs to their present value in their BCA. Applicants should discount each category of benefits and costs separately for each year in the analysis period during which they accrue. Appendix B provides additional information on the formulas that should be used in discounting future values to present values, and presents a simplified example table. Additionally, the chart below illustrates the current value of a single dollar given number of years in the future (discounting at 7 percent).
<table>
<thead>
<tr>
<th>EVENT NO</th>
<th>PRIM NAME (24)</th>
<th>MILE POST (28)</th>
<th>DIST FT</th>
<th>DIST MILE (29)</th>
<th>DIRECT FROM (29)</th>
<th>REFEREE NAME (30)</th>
<th>Action (31)</th>
<th>Accident Type</th>
<th>LOC ID (31A)</th>
<th>CRASH SEVER (6)</th>
<th>KABCCO</th>
<th>CMF</th>
<th>CMF Counter-measure Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>06-10572</td>
<td>KALANIKAUMAKA ST</td>
<td>5.66 0.895</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>520</td>
<td>POIPU RD</td>
<td>4.3</td>
<td>0.1</td>
<td>0.1</td>
<td>LOPAPA PAIPA BLVD</td>
<td>12</td>
</tr>
<tr>
<td>11-22358</td>
<td>ALA KALANIKAUMAKA ST</td>
<td>5.66 0.895</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>520</td>
<td>POIPU RD</td>
<td>4.2</td>
<td>0.0</td>
<td>0.1</td>
<td>LOPAPA PAIPA BLVD</td>
<td>21</td>
</tr>
<tr>
<td>09-08210</td>
<td>ALA KALANIKAUMAKA ST</td>
<td>5.66 0.895</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>520</td>
<td>POIPU RD</td>
<td>3.4</td>
<td>0.0</td>
<td>0.1</td>
<td>KIPUHI RD</td>
<td>6</td>
</tr>
<tr>
<td>09-15871</td>
<td>ALA KALANIKAUMAKA ST</td>
<td>5.66 0.895</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>520</td>
<td>POIPU RD</td>
<td>5.2</td>
<td>0.0</td>
<td>0.1</td>
<td>KAPILI RD</td>
<td>23</td>
</tr>
<tr>
<td>12-02723</td>
<td>ALA KALANIKAUMAKA ST</td>
<td>5.66 0.895</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>520</td>
<td>POIPU RD</td>
<td>6.0</td>
<td>0.0</td>
<td>0.1</td>
<td>KIPIHI ST</td>
<td>1</td>
</tr>
<tr>
<td>09-27981</td>
<td>ALA KALANIKAUMAKA ST</td>
<td>5.66 0.895</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>520</td>
<td>POIPU RD</td>
<td>5.8</td>
<td>0.0</td>
<td>0.1</td>
<td>HODOWILI RD</td>
<td>11</td>
</tr>
<tr>
<td>10-08801</td>
<td>ALA KALANIKAUMAKA ST</td>
<td>5.66 0.895</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>520</td>
<td>POIPU RD</td>
<td>5.0</td>
<td>0.0</td>
<td>0.2</td>
<td>W</td>
<td>87 Broadside</td>
</tr>
<tr>
<td>10-00280</td>
<td>ALA KALANIKAUMAKA ST</td>
<td>5.66 0.895</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>520</td>
<td>POIPU RD</td>
<td>5.2</td>
<td>0.0</td>
<td>0.1</td>
<td>KAPILI RD</td>
<td>11</td>
</tr>
<tr>
<td>07-01513</td>
<td>ALA KALANIKAUMAKA ST</td>
<td>5.66 0.895</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>520</td>
<td>POIPU RD</td>
<td>5.2</td>
<td>0.0</td>
<td>0.1</td>
<td>KAPILI RD</td>
<td>11</td>
</tr>
<tr>
<td>06-20037</td>
<td>ALA KALANIKAUMAKA ST</td>
<td>5.66 0.895</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>520</td>
<td>POIPU RD</td>
<td>6.5</td>
<td>0.0</td>
<td>0.1</td>
<td>ALA KINOKI</td>
<td>1</td>
</tr>
<tr>
<td>03-35068</td>
<td>ALA KALANIKAUMAKA ST</td>
<td>5.66 0.895</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>520</td>
<td>POIPU RD</td>
<td>6.5</td>
<td>0.0</td>
<td>0.1</td>
<td>ALA KINOKI</td>
<td>23</td>
</tr>
<tr>
<td>12-03030</td>
<td>ALA KALANIKAUMAKA ST</td>
<td>5.66 0.895</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>520</td>
<td>POIPU RD</td>
<td>6.4</td>
<td>0.0</td>
<td>0.1</td>
<td>ALA KINOKI</td>
<td>1</td>
</tr>
<tr>
<td>06-03754</td>
<td>ALA KALANIKAUMAKA ST</td>
<td>5.66 0.895</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>520</td>
<td>POIPU RD</td>
<td>6.5</td>
<td>0.0</td>
<td>0.1</td>
<td>ALA KINOKI</td>
<td>2</td>
</tr>
<tr>
<td>07-26794</td>
<td>ALA KALANIKAUMAKA ST</td>
<td>5.66 0.895</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>520</td>
<td>POIPU RD</td>
<td>5.5</td>
<td>0.0</td>
<td>0.1</td>
<td>KIAHUNA PLTN DR</td>
<td>11</td>
</tr>
<tr>
<td>09-24299</td>
<td>ALA KALANIKAUMAKA ST</td>
<td>5.66 0.895</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>520</td>
<td>POIPU RD</td>
<td>5.0</td>
<td>0.0</td>
<td>0.1</td>
<td>KIAHUNA PLTN DR</td>
<td>11</td>
</tr>
<tr>
<td>11-11538</td>
<td>ALA KALANIKAUMAKA ST</td>
<td>5.66 0.895</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>520</td>
<td>POIPU RD</td>
<td>6.4</td>
<td>0.0</td>
<td>0.1</td>
<td>ALA KINOKI</td>
<td>11</td>
</tr>
<tr>
<td>12-21196</td>
<td>ALA KALANIKAUMAKA ST</td>
<td>5.66 0.895</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>520</td>
<td>POIPU RD</td>
<td>6.4</td>
<td>0.0</td>
<td>0.1</td>
<td>ALA KINOKI</td>
<td>11</td>
</tr>
<tr>
<td>07-32246</td>
<td>ALA KALANIKAUMAKA ST</td>
<td>5.66 0.895</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>520</td>
<td>POIPU RD</td>
<td>6.4</td>
<td>0.0</td>
<td>0.1</td>
<td>ALA KINOKI</td>
<td>0</td>
</tr>
<tr>
<td>06-31724</td>
<td>ALA KALANIKAUMAKA ST</td>
<td>5.66 0.895</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>520</td>
<td>POIPU RD</td>
<td>5.4</td>
<td>0.0</td>
<td>0.1</td>
<td>KIAHUNA PLTN DR</td>
<td>11</td>
</tr>
<tr>
<td>06-19044</td>
<td>ALA KALANIKAUMAKA ST</td>
<td>5.66 0.895</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>520</td>
<td>POIPU RD</td>
<td>6.4</td>
<td>0.0</td>
<td>0.1</td>
<td>ALA KINOKI</td>
<td>0</td>
</tr>
<tr>
<td>09-08103</td>
<td>ALA KALANIKAUMAKA ST</td>
<td>5.66 0.895</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>520</td>
<td>POIPU RD</td>
<td>6.4</td>
<td>0.0</td>
<td>0.1</td>
<td>ALA KINOKI</td>
<td>0</td>
</tr>
<tr>
<td>07-12183</td>
<td>ALA KALANIKAUMAKA ST</td>
<td>5.66 0.895</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>520</td>
<td>POIPU RD</td>
<td>6.4</td>
<td>0.0</td>
<td>0.1</td>
<td>ALA KINOKI</td>
<td>0</td>
</tr>
</tbody>
</table>
### Roundabouts

<table>
<thead>
<tr>
<th>Accident Counts</th>
<th>2006-2012</th>
<th>O</th>
<th>C</th>
<th>B</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>[Pr(AISx)*Value(AISx)]</td>
<td>6</td>
<td>[Pr(AISx)*Value(AISx)]</td>
<td>3</td>
<td>[Pr(AISx)*Value(AISx)]</td>
</tr>
<tr>
<td>AIS 0</td>
<td>3.70136 $</td>
<td>-</td>
<td>1.40622 $</td>
<td>-</td>
<td>0.25041 $</td>
</tr>
<tr>
<td>AIS 1</td>
<td>0.29028 $</td>
<td>8,360.06 $</td>
<td>4.13676 $</td>
<td>119,138.69 $</td>
<td>2.30529 $</td>
</tr>
<tr>
<td>AIS 2</td>
<td>0.00792 $</td>
<td>3,573.50 $</td>
<td>0.38346 $</td>
<td>173,017.15 $</td>
<td>0.32694 $</td>
</tr>
<tr>
<td>AIS 3</td>
<td>0.00032 $</td>
<td>322.56 $</td>
<td>0.06426 $</td>
<td>64,774.08 $</td>
<td>0.09573 $</td>
</tr>
<tr>
<td>AIS 4</td>
<td>0.00000 $</td>
<td>-</td>
<td>0.00852 $</td>
<td>21,756.67 $</td>
<td>0.01860 $</td>
</tr>
<tr>
<td>AIS 5</td>
<td>0.00012 $</td>
<td>683.14 $</td>
<td>0.00078 $</td>
<td>4,440.38 $</td>
<td>0.00303 $</td>
</tr>
<tr>
<td>SUBTOTALS</td>
<td>4.00 $</td>
<td>12,939.26 $</td>
<td>6.00 $</td>
<td>383,126.98 $</td>
<td>3.00 $</td>
</tr>
</tbody>
</table>

**TOTAL VALUE OF INJURIES $ 1,689,456.48**

| 7-year (2006-2012) value of injuries $ | 1,689,456.48 |
| Yearly average value of injuries $ | 241,350.93 |
| Estimated Crash Reduction | 58% |
| Estimated Yearly Crash Reduction Benefit $ | 139,983.54 |
| Estimated Crash Reduction Benefit over a 20 year period $ | 2,799,670.74 |

**CMF Reduction applied:**

<table>
<thead>
<tr>
<th>CMF ID</th>
<th>Name</th>
<th>CMF</th>
<th>CRF (1-CMF)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roundabouts</td>
<td>207</td>
<td>Conversion of stop-controlled intersection into single-lane roundabout</td>
<td>0.42</td>
</tr>
</tbody>
</table>
Raised Medians

<table>
<thead>
<tr>
<th>Accident Counts</th>
<th>O $ Value</th>
<th>C $ Value</th>
<th>B $ Value</th>
<th>A $ Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>AIS 0</td>
<td>2.77602</td>
<td>0.23437</td>
<td>0.16694</td>
<td>0.00000</td>
</tr>
<tr>
<td>AIS 1</td>
<td>0.21771</td>
<td>6,270.05</td>
<td>19,856.45</td>
<td>44,261.57</td>
</tr>
<tr>
<td>AIS 2</td>
<td>0.00594</td>
<td>2,680.13</td>
<td>28,836.19</td>
<td>98,343.55</td>
</tr>
<tr>
<td>AIS 3</td>
<td>0.00024</td>
<td>241.92</td>
<td>10,795.68</td>
<td>64,330.56</td>
</tr>
<tr>
<td>AIS 4</td>
<td>0.00000</td>
<td>-</td>
<td>3,626.11</td>
<td>31,664.64</td>
</tr>
<tr>
<td>AIS 5</td>
<td>0.00009</td>
<td>512.35</td>
<td>740.06</td>
<td>11,499.46</td>
</tr>
<tr>
<td>Fatality</td>
<td>0.00000</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>SUBTOTALS</td>
<td>3.00</td>
<td>9,704.45</td>
<td>63,854.50</td>
<td>250,099.78</td>
</tr>
</tbody>
</table>

**TOTAL VALUE OF FATALITIES AND INJURIES**  $323,658.72

<table>
<thead>
<tr>
<th>7-year (2006-2012) value of injuries</th>
<th>$323,658.72</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yearly average value of injuries</td>
<td>$46,236.96</td>
</tr>
<tr>
<td>Estimated Crash Reduction</td>
<td>39%</td>
</tr>
<tr>
<td>Estimated Yearly Crash Reduction</td>
<td>$18,032.41</td>
</tr>
<tr>
<td>Estimated Crash Reduction Benefit</td>
<td>$360,648.29</td>
</tr>
</tbody>
</table>

**CMF Reduction applied:**

<table>
<thead>
<tr>
<th>CMF ID</th>
<th>Name</th>
<th>CMF</th>
<th>CRF (1-CMF)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medians</td>
<td>Install Raised Median</td>
<td>0.61</td>
<td>0.39</td>
</tr>
</tbody>
</table>
### Bike Lanes

<table>
<thead>
<tr>
<th>Accident Counts</th>
<th>O: No Injury</th>
<th>C: Possible Injury</th>
<th>B: Non-incapacitating</th>
<th>A: Incapacitating</th>
</tr>
</thead>
<tbody>
<tr>
<td>AIS 0</td>
<td>0.92534 $</td>
<td>0.23437 $</td>
<td>0.08347 $</td>
<td>0.00000 $</td>
</tr>
<tr>
<td>AIS 1</td>
<td>0.07257 $</td>
<td>2,090.02</td>
<td>19,856.45</td>
<td>22,130.78 $</td>
</tr>
<tr>
<td>AIS 2</td>
<td>0.00198 $</td>
<td>893.38</td>
<td>28,836.19</td>
<td>49,171.78 $</td>
</tr>
<tr>
<td>AIS 3</td>
<td>0.00008 $</td>
<td>80.64</td>
<td>10,795.68</td>
<td>32,165.28 $</td>
</tr>
<tr>
<td>AIS 4</td>
<td>0.00000 $</td>
<td>-</td>
<td>3,626.11</td>
<td>15,832.32 $</td>
</tr>
<tr>
<td>Fatality</td>
<td>0.00003 $</td>
<td>170.78</td>
<td>740.06</td>
<td>5,749.73 $</td>
</tr>
<tr>
<td>SUBTOTALS</td>
<td>1.00 $</td>
<td>3,234.82</td>
<td>63,854.50</td>
<td>125,049.89 $</td>
</tr>
</tbody>
</table>

**TOTAL VALUE OF FATALITIES AND INJURIES** $192,139.20

- 7-year (2006-2012) value of injuries $192,139.20
- Yearly average value of injuries $27,448.46
- Estimated Crash Reduction 58%
- Estimated Yearly Crash Reduction Benefit $15,920.11
- Estimated Crash Reduction Benefit over a 20 year period $318,402.10

### CMF Reduction applied:

<table>
<thead>
<tr>
<th>CMF ID</th>
<th>Name</th>
<th>CMF</th>
<th>CRF (1-CMF)</th>
</tr>
</thead>
<tbody>
<tr>
<td>7840</td>
<td>Install Bicycle Lanes</td>
<td>0.42</td>
<td>0.58</td>
</tr>
</tbody>
</table>
### SideWalks

<table>
<thead>
<tr>
<th>Accident Counts</th>
<th>2006-2012</th>
<th>O</th>
<th>Possible Injury</th>
<th>Non-incapacitating</th>
<th>Incapacitating</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2006-2012</td>
<td>O</td>
<td>Value</td>
<td>Value</td>
<td>Value</td>
</tr>
<tr>
<td>AIS 0</td>
<td>0.00000</td>
<td>0</td>
<td>$0.00000</td>
<td>$0.00000</td>
<td>$0.08347</td>
</tr>
<tr>
<td>AIS 1</td>
<td>0.00000</td>
<td>0</td>
<td>$0.00000</td>
<td>$0.00000</td>
<td>$0.76843</td>
</tr>
<tr>
<td>AIS 2</td>
<td>0.00000</td>
<td>0</td>
<td>$0.00000</td>
<td>$0.00000</td>
<td>$0.10898</td>
</tr>
<tr>
<td>AIS 3</td>
<td>0.00000</td>
<td>0</td>
<td>$0.00000</td>
<td>$0.00000</td>
<td>$0.03191</td>
</tr>
<tr>
<td>AIS 4</td>
<td>0.00000</td>
<td>0</td>
<td>$0.00000</td>
<td>$0.00000</td>
<td>$0.00620</td>
</tr>
<tr>
<td>AIS 5</td>
<td>0.00000</td>
<td>0</td>
<td>$0.00000</td>
<td>$0.00000</td>
<td>$0.00101</td>
</tr>
<tr>
<td>Fatality</td>
<td>0.00000</td>
<td>0</td>
<td>$0.00000</td>
<td>$0.00000</td>
<td>$0.00000</td>
</tr>
<tr>
<td>SUBTOTALS</td>
<td>0.00000</td>
<td>0</td>
<td>$0.00000</td>
<td>$0.00000</td>
<td>$1.00000</td>
</tr>
</tbody>
</table>

**TOTAL VALUE OF FATALITIES AND INJURIES** $125,049.89

| 7-year (2006-2012) value of injuries | $125,049.89 |
| Yearly average value of injuries | $17,864.27 |
| Estimated Crash Reduction | 59% |
| Estimated Yearly Crash Reduction Benefit | $10,539.92 |
| Estimated Crash Reduction Benefit over a 20 year period | $210,798.38 |

**CMF Reduction applied:**

<table>
<thead>
<tr>
<th>CMF ID</th>
<th>Name</th>
<th>CMF</th>
<th>CRF (1-CMF)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sidewalk</td>
<td>Install Sidewalk</td>
<td>0.41</td>
<td>0.59</td>
</tr>
</tbody>
</table>
### Shoulder - CRF #1

<table>
<thead>
<tr>
<th>Accident Count</th>
<th>AIS 0</th>
<th>AIS 1</th>
<th>AIS 2</th>
<th>AIS 3</th>
<th>AIS 4</th>
<th>AIS 5</th>
<th>Fatality</th>
<th>SUBTOTALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>$ Value</td>
<td>4.6267</td>
<td>0.36285</td>
<td>0.00990</td>
<td>0.0040</td>
<td>0.00000</td>
<td>0.00015</td>
<td>0.00000</td>
<td>5.00</td>
</tr>
<tr>
<td>$ Value</td>
<td></td>
<td>10,450.08</td>
<td>4,466.88</td>
<td>403.20</td>
<td></td>
<td>853.92</td>
<td></td>
<td>16,174.08</td>
</tr>
</tbody>
</table>

**Total Value of Fatalities and Injuries:** $16,174.08

### Shoulder - CRF #2

<table>
<thead>
<tr>
<th>Accident Count</th>
<th>AIS 0</th>
<th>AIS 1</th>
<th>AIS 2</th>
<th>AIS 3</th>
<th>AIS 4</th>
<th>AIS 5</th>
<th>Fatality</th>
<th>SUBTOTALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>$ Value</td>
<td>0.92534</td>
<td>0.07257</td>
<td>0.00198</td>
<td>0.00008</td>
<td>0.00000</td>
<td>0.00015</td>
<td>0.00000</td>
<td>1.00</td>
</tr>
<tr>
<td>$ Value</td>
<td></td>
<td>2,090.02</td>
<td>893.38</td>
<td>89.38</td>
<td></td>
<td>853.92</td>
<td></td>
<td>3,234.82</td>
</tr>
</tbody>
</table>

**Total Value of Fatalities and Injuries:** $1,154,118.14

**CMF Reduction applied:**

<table>
<thead>
<tr>
<th>CMF ID</th>
<th>Name</th>
<th>CMF</th>
<th>CRF (1-CMF)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6362</td>
<td>Widen Shoulder</td>
<td>0.8</td>
<td>0.2</td>
</tr>
<tr>
<td>6356</td>
<td>Widen Shoulder</td>
<td>0.93</td>
<td>0.07</td>
</tr>
</tbody>
</table>
Crashes not impacted by Build

<table>
<thead>
<tr>
<th>2006-2012</th>
<th>O</th>
<th>C</th>
<th>B</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accident Counts</td>
<td>No Injury</td>
<td>Possible Injury</td>
<td>Non-incapacitating</td>
<td>Incapacitating</td>
</tr>
<tr>
<td>AIS 0</td>
<td>4.62670</td>
<td>1.40622</td>
<td>0.33388</td>
<td>0.00000</td>
</tr>
<tr>
<td>AIS 1</td>
<td>0.36285</td>
<td>10,450.08</td>
<td>3.07372</td>
<td>0.00000</td>
</tr>
<tr>
<td>AIS 2</td>
<td>0.00990</td>
<td>4,466.88</td>
<td>0.43592</td>
<td>0.00000</td>
</tr>
<tr>
<td>AIS 3</td>
<td>0.00040</td>
<td>403.20</td>
<td>0.12764</td>
<td>0.00000</td>
</tr>
<tr>
<td>AIS 4</td>
<td>0.00000</td>
<td>-</td>
<td>0.02480</td>
<td>0.00000</td>
</tr>
<tr>
<td>Fatality</td>
<td>0.00015</td>
<td>853.92</td>
<td>0.00404</td>
<td>0.00000</td>
</tr>
<tr>
<td>SUBTOTALS</td>
<td>5.00</td>
<td>16,174.08</td>
<td>4.00</td>
<td>0.00</td>
</tr>
</tbody>
</table>

**TOTAL VALUE OF FATALITIES AND INJURIES** $899,500.61

- 7-year (2006-2012) value of injuries $899,500.61
- Yearly average value of injuries $128,500.09
- Estimated Crash Reduction NA
- Estimated Yearly Crash Reduction Benefit $0
- Estimated Crash Reduction Benefit over a 20 year period $0
**Methodology to Estimate One-Time Net Increase in Property Value of Infill Land**

*Analysis assumes future value of infill parcels is consistent with current value of developed parcels in similar zoning classes (on or in proximity to Poipu Road).*

<table>
<thead>
<tr>
<th>Steps</th>
<th>Action</th>
<th>Data Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Identify developable vacant parcels with zoning adjacent to Poipu Road and assess total acreage per zoning class</td>
<td>COK Real Property; COK Planning</td>
</tr>
<tr>
<td>2</td>
<td>Calculate an average property value per acre of developed land by zoning class. For each zoning class, select sample parcels close to or adjacent to the developable parcel.</td>
<td>COK Real Property; COK Planning</td>
</tr>
<tr>
<td>3</td>
<td>Apply the sample average developed property valuation per acre by zoning class to the existing total acreage of infill land per zoning class. Subtract from this amount the existing total property valuation by zoning class. Add the zoning class net increase for the total net increase in property value of infill land.</td>
<td></td>
</tr>
</tbody>
</table>
**Step 1: Identify developable vacant parcels with zoning adjacent to Poipu Road and assess total acreage per zoning class**

Methodology to Estimate One-Time Net Increase in Property Value for Infill Land

<table>
<thead>
<tr>
<th>Zoning Class</th>
<th>Zoning</th>
<th>TMKs adjacent or near Poipu Road</th>
<th>Assessment Year</th>
<th>Property Class</th>
<th>Total Market Value</th>
<th>Total Property Assessed Value</th>
<th>Total Property Exemption</th>
<th>Total Net Taxable Value</th>
<th>Total Acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commercial</td>
<td>T4VC</td>
<td>280040030000</td>
<td>2020</td>
<td>COMMERCIAL</td>
<td>$6,618,500</td>
<td>$6,618,500</td>
<td>0</td>
<td>$6,618,500</td>
<td>7.982</td>
</tr>
<tr>
<td>Commercial</td>
<td>CN</td>
<td>260150090000</td>
<td>2020</td>
<td>COMMERCIAL</td>
<td>$3,600,200</td>
<td>$3,600,200</td>
<td>0</td>
<td>$3,600,200</td>
<td>4.214</td>
</tr>
<tr>
<td>Commercial</td>
<td>CN</td>
<td>280140260000</td>
<td>2020</td>
<td>COMMERCIAL</td>
<td>$3,523,600</td>
<td>$3,523,600</td>
<td>0</td>
<td>$3,523,600</td>
<td>3.815</td>
</tr>
<tr>
<td>Resort</td>
<td>RR-20/VDA</td>
<td>280150820000</td>
<td>2020</td>
<td>HOTEL &amp; RESORT</td>
<td>$10,159,600</td>
<td>$10,159,600</td>
<td>0</td>
<td>$10,159,600</td>
<td>9.718</td>
</tr>
<tr>
<td>Resort</td>
<td>R-20/VDA</td>
<td>280140300000</td>
<td>2020</td>
<td>COMMERCIAL</td>
<td>$3,776,000</td>
<td>$3,776,000</td>
<td>0</td>
<td>$3,776,000</td>
<td>7.685</td>
</tr>
<tr>
<td>Resort</td>
<td>R-10/VDA</td>
<td>280140320000</td>
<td>2020</td>
<td>RESIDENTIAL</td>
<td>$11,200,000</td>
<td>$11,200,000</td>
<td>0</td>
<td>$11,200,000</td>
<td>25</td>
</tr>
</tbody>
</table>

**Zoning Class Description**

- **Commercial** Includes Neighborhood Commercial, General Commercial, T4-Village Center, T4-Village Center Flex
- **Resort** Includes the following zoning districts within the Visitor Destination Area: All Resort Districts (RR-10, RR-20), and all residential districts at R-10 and higher (R-10, R-20).

<table>
<thead>
<tr>
<th>Zoning Class</th>
<th>Total Undeveloped Acreage</th>
<th>Total Property Assessed Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commercial</td>
<td>16.011</td>
<td>$13,742,300</td>
</tr>
<tr>
<td>Resort</td>
<td>43</td>
<td>$25,135,600</td>
</tr>
</tbody>
</table>
Step 2: Calculate an average property value per acre of developed land by zoning class. For each zoning class, select sample parcels close to or adjacent to the developable parcel.

### Methodology to Estimate One-Time Net Increase in Property Value for Infill Land

<table>
<thead>
<tr>
<th>Zoning Class</th>
<th>Zoning</th>
<th>Sample Developed Parcel TMKs</th>
<th>Assessment Year</th>
<th>Property Class</th>
<th>Total Market Value</th>
<th>Total Property Assessed Value</th>
<th>Total Property Exemption</th>
<th>Total Net Taxable Value</th>
<th>Total Acres</th>
<th>Average Total Property Assessed Value per Acre</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commercial</td>
<td>T4VC</td>
<td>2800803600000</td>
<td>2020</td>
<td>COMMERCIAL</td>
<td>$2,286,400</td>
<td>$2,286,400</td>
<td>0</td>
<td>$2,286,400</td>
<td>0.7082</td>
<td>$3,228,467</td>
</tr>
<tr>
<td>Commercial</td>
<td>T4VC</td>
<td>2800701600000</td>
<td>2020</td>
<td>COMMERCIAL</td>
<td>$1,826,000</td>
<td>$1,826,000</td>
<td>0</td>
<td>$1,826,000</td>
<td>0.7598</td>
<td>$2,403,264</td>
</tr>
<tr>
<td>Commercial</td>
<td>T4VC</td>
<td>2800804200000</td>
<td>2020</td>
<td>COMMERCIAL</td>
<td>$3,516,800</td>
<td>$3,516,800</td>
<td>0</td>
<td>$3,516,800</td>
<td>1.074</td>
<td>$3,274,488</td>
</tr>
<tr>
<td>Commercial</td>
<td>CN</td>
<td>2801402900000</td>
<td>2020</td>
<td>COMMERCIAL</td>
<td>$11,549,100</td>
<td>$11,549,100</td>
<td>0</td>
<td>$11,549,100</td>
<td>4.485</td>
<td>$2,575,050</td>
</tr>
<tr>
<td>Commercial</td>
<td>CN - check FBC</td>
<td>2600400500000</td>
<td>2020</td>
<td>COMMERCIAL</td>
<td>$1,946,400</td>
<td>$1,946,400</td>
<td>0</td>
<td>$1,946,400</td>
<td>0.8022</td>
<td>$2,426,328</td>
</tr>
<tr>
<td>Resort</td>
<td>RR-20</td>
<td>2801600400000</td>
<td>2020</td>
<td>HOTEL &amp; RESORT</td>
<td>$30,154,200</td>
<td>$30,154,200</td>
<td>0</td>
<td>$30,154,200</td>
<td>10.73</td>
<td>$2,810,270</td>
</tr>
<tr>
<td>Resort</td>
<td>RR-20</td>
<td>2801600300000</td>
<td>2020</td>
<td>HOTEL &amp; RESORT</td>
<td>$54,999,200</td>
<td>$54,999,200</td>
<td>0</td>
<td>$54,999,200</td>
<td>8.444</td>
<td>$6,513,406</td>
</tr>
<tr>
<td>Resort</td>
<td>RR-10</td>
<td>2900100200000</td>
<td>2020</td>
<td>HOTEL &amp; RESORT</td>
<td>$260,143,300</td>
<td>$260,143,300</td>
<td>0</td>
<td>$260,143,300</td>
<td>37.742</td>
<td>$6,892,674</td>
</tr>
<tr>
<td>Resort</td>
<td>R-20</td>
<td>2801701900000</td>
<td>2020</td>
<td>HOTEL &amp; RESORT</td>
<td>$15,943,900</td>
<td>$15,943,900</td>
<td>0</td>
<td>$15,943,900</td>
<td>1.0421</td>
<td>$15,299,779</td>
</tr>
</tbody>
</table>

### Zoning Class Average Property Value per Acre

<table>
<thead>
<tr>
<th>Zoning Class</th>
<th>Average Property Value per Acre</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commercial</td>
<td>$2,781,519</td>
</tr>
<tr>
<td>Resort</td>
<td>$7,879,032</td>
</tr>
</tbody>
</table>
Step 3: Apply the sample average developed property valuation per acre by zoning class to the existing total acreage of infill land per zoning class. Subtract from this amount the existing total property valuation by zoning class. Add the zoning class net increase for the total net increase in property value of infill land.

Methodology to Estimate One-Time Net Increase in Property Value for Infill Land

<table>
<thead>
<tr>
<th>Zoning Class</th>
<th>Description</th>
<th>Total Undeveloped Acreage by Zoning Class</th>
<th>Sample Developed Parcel Property Valuation per Acre</th>
<th>Estimated Property Value</th>
<th>Existing Property Value of Total Acreage by Zoning Class</th>
<th>Net Increase per Zoning Class</th>
<th>% directly due to BUILD Project</th>
<th>Net Increase per Zoning Class</th>
<th>Discounted Amount [based on one time increase for Year 2027]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commercial</td>
<td>Includes Neighborhood Commercial, General Commercial, T4-Village Center, T4-Village Center Flex</td>
<td>16.011</td>
<td>$2,781,519</td>
<td>$44,534,904.60</td>
<td>$13,742,300</td>
<td>$30,792,604.60</td>
<td>50%</td>
<td>$15,396,302.30</td>
<td>$9,588,043</td>
</tr>
<tr>
<td>Resort</td>
<td>Includes the following zoning districts within the Visitor Destination Area: All Resort Districts (RR-10, RR-20), and all residential districts at R-10 and higher (R-10, R-20).</td>
<td>43</td>
<td>$7,879,032</td>
<td>$337,135,916.03</td>
<td>$25,135,600</td>
<td>$312,000,316.03</td>
<td>50%</td>
<td>$156,000,158.01</td>
<td>$97,149,658</td>
</tr>
</tbody>
</table>

**Estimated Net Increase in Property Valuation of Undeveloped Infill Parcels**

| Estimated Net Increase in Property Valuation of Undeveloped Infill Parcels | $342,792,921 | % directly due to BUILD Project | $171,396,460 | Discounted Amount [based on increase for Year 2027] | $106,737,101 |

The following formula should be used to discount future benefits and costs:

\[ PV = \frac{FV}{(1 + i)^t} \]

Where:
- \( PV \) = Present discounted value of a future payment from year \( t \)
- \( FV \) = Future value of payment in real dollars (i.e., dollars that have the same purchasing power as in the base year of the analysis, see the next section for further discussion on this topic) in year \( t \)
- \( i \) = Real discount rate applied (7%)
- \( t \) = Years in the future for payment (where base year of analysis is \( t = 0 \))
**Methodology to Estimate One-Time Net Increase in Property Value for Unzoned Land**

*Analysis assumes the future value of parcels slated for urban expansion, currently without State Land Use Urban District, is consistent with current value of similar parcels within the State Land Use Urban District.*

<table>
<thead>
<tr>
<th>Steps</th>
<th>Action</th>
<th>Data Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Assess the total acreage and existing property value of the agricultural land adjacent to Poipu Road that is recommended for urban expansion by County plans.</td>
<td>General Plan (2018); South Kauai Community Plan (2015); COK Real Property</td>
</tr>
<tr>
<td>2</td>
<td>Assess the average property value per acre of undeveloped urban land in or near South Kauai and calculate an average property value per acre of undeveloped urban land.</td>
<td>COK Real Property; COK Planning</td>
</tr>
<tr>
<td>3</td>
<td>Apply the average property value per acre of urban land (Step 2) to the total acreage recommended for urban expansion. This number is the estimated gross total property value. Subtract the existing property value from from Step 1 to determine the net increase in property value.</td>
<td></td>
</tr>
</tbody>
</table>
Step 1: Assess the total acreage and existing property value of the agricultural land adjacent to Poipu Road that is recommended for urban expansion by County plans.

Methodology to Estimate One-Time Net Increase in Property Value for Unzoned Land

<table>
<thead>
<tr>
<th>Property Description *See Note</th>
<th>TMKs within area recommended for urban expansion</th>
<th>Assessment Year</th>
<th>Property Class</th>
<th>Total Market Value</th>
<th>Total Property Assessed Value</th>
<th>Total Property Exemption</th>
<th>Total Net Taxable Value</th>
<th>2019 Tax</th>
<th>Total Acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>Within Poipu Gateway Mixed Use (east of Ala Kinoiki)</td>
<td>280220240000</td>
<td>2020</td>
<td>AGRICULTURAL</td>
<td>$1,682,900</td>
<td>$15,900</td>
<td>$0</td>
<td>$15,900</td>
<td>$150</td>
<td>37.314</td>
</tr>
<tr>
<td>Within Poipu Mixed Use Gateway (east of Ala Kinoiki)</td>
<td>280220250000</td>
<td>2020</td>
<td>AGRICULTURAL</td>
<td>$1,395,500</td>
<td>$9,400</td>
<td>$0</td>
<td>$9,400</td>
<td>$150</td>
<td>31.821</td>
</tr>
<tr>
<td>Within Poipu Mixed Use Gateway (east of Ala Kinoiki)</td>
<td>280220260000</td>
<td>2020</td>
<td>AGRICULTURAL</td>
<td>$1,403,800</td>
<td>$9,400</td>
<td>$0</td>
<td>$9,400</td>
<td>$150</td>
<td>25.152</td>
</tr>
<tr>
<td>Within Poipu Mixed Use Gateway (at intersection of Poipu Road and Ala Kinoiki)</td>
<td>280220040000</td>
<td>2020</td>
<td>AGRICULTURAL</td>
<td>$1,323,300</td>
<td>$9,700</td>
<td>$0</td>
<td>$9,700</td>
<td>$150</td>
<td>22.93</td>
</tr>
<tr>
<td>Within Poipu Mixed Use Gateway (at intersection of Poipu Road and Ala Kinoiki)</td>
<td>280220170000</td>
<td>2020</td>
<td>AGRICULTURAL</td>
<td>$1,239,500</td>
<td>$8,300</td>
<td>$0</td>
<td>$8,300</td>
<td>$150</td>
<td>19.579</td>
</tr>
<tr>
<td>Within Poipu Mixed Use Gateway (west of Ala Kinoiki)</td>
<td>280220160000</td>
<td>2020</td>
<td>AGRICULTURAL</td>
<td>$1,145,200</td>
<td>$16,800</td>
<td>$0</td>
<td>$16,800</td>
<td>$150</td>
<td>15.807</td>
</tr>
</tbody>
</table>

Total Acreage | 152.603 |
Total Property Assessed Value | $69,500 |
Total Value per Acre | $455 |

Note: The South Kauai Community Plan was adopted in 2015. The plan calls for the majority of South Kauai's growth to be located in a new mixed-use residential neighborhood called the "Poipu Gateway Mixed Use Village". This area is located at the intersection of Poipu Road and Ala Kinoiki. The area boundary is detailed in the South Kauai Land Use Plan: https://www.kauai.gov/Portals/0/Planning/SKCP_Chapter4_reduced.pdf?ver=2015-08-26-145033-263
Step 2: Assess the average property value per acre of undeveloped urban land in or near South Kauai and calculate an average property value per acre of undeveloped urban land.

Methodology to Estimate One-Time Net Increase in Property Value for Unzoned Land

<table>
<thead>
<tr>
<th>Property Description</th>
<th>*See Note</th>
<th>TMKs within area recommended for urban expansion</th>
<th>Assessment Year</th>
<th>Property Class</th>
<th>Total Market Value</th>
<th>Total Property Assessed Value</th>
<th>Total Property Exemption</th>
<th>Total Net Taxable Value</th>
<th>Total Acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grove Farm Wailani; State Land Use District/Residential and Commercial Zoning; Not subdivided</td>
<td>360020010000</td>
<td>2020</td>
<td>RESIDENTIAL/COMMERCIAL</td>
<td>$37,117,400</td>
<td>$37,117,400</td>
<td>0</td>
<td>$37,117,400</td>
<td>132.351</td>
<td></td>
</tr>
<tr>
<td>DR Horton; State Land Use District/Residential Zoning; Not subdivided</td>
<td>370030300000</td>
<td>2020</td>
<td>RESIDENTIAL</td>
<td>$1,395,400</td>
<td>$1,395,400</td>
<td>0</td>
<td>$1,395,400</td>
<td>14.166</td>
<td></td>
</tr>
<tr>
<td>DR Horton; State Land Use District/Residential Zoning; Not subdivided</td>
<td>370030290000</td>
<td>2020</td>
<td>RESIDENTIAL</td>
<td>$1,017,300</td>
<td>$1,017,300</td>
<td>0</td>
<td>$1,017,300</td>
<td>9.515</td>
<td></td>
</tr>
</tbody>
</table>

Total Acreage 156.032
Total Property Assessed Value $39,530,100
Total Value per Acre $253,346

Note: The parcels listed are within the State Land Use Urban District and slated for residential and commercial use in County plans. Like the parcels in the Poipu Gateway Mixed Use Village, they are large parcels, not yet subdivided.
### Methodology to Estimate One-Time Net Increase in Property Value for Unzoned Land

**Step 1:** Total Acreage

<table>
<thead>
<tr>
<th>Step 1: Total Acreage</th>
<th>152.603</th>
</tr>
</thead>
</table>

**Step 2:** Value per Acre

<table>
<thead>
<tr>
<th>Step 2: Value per Acre</th>
<th>$253,346</th>
</tr>
</thead>
</table>

**Estimated Gross Total Property Value**

<table>
<thead>
<tr>
<th>Estimated Gross Total Property Value</th>
<th>$38,661,376</th>
</tr>
</thead>
</table>

**Existing Total Property Value**

<table>
<thead>
<tr>
<th>Existing Total Property Value</th>
<th>$69,500</th>
</tr>
</thead>
</table>

**Estimated Net Increase in Property Value**

<table>
<thead>
<tr>
<th>Estimated Net Increase in Property Value</th>
<th>$38,591,876</th>
</tr>
</thead>
</table>

**Discounted Estimated Net Increase in Property Value (based on one time increase for Calendar Year 2032)**

<table>
<thead>
<tr>
<th>Discounted Estimated Net Increase in Property Value (based on one time increase for Calendar Year 2032)</th>
<th>$17,135,255</th>
</tr>
</thead>
</table>

**Step 3:** Apply the average property value per acre of urban land (Step 2) to the total acreage recommended for urban expansion. This number is the estimated gross total property value. Subtract the existing property value from from Step 1 to determine the net increase in property value.
Baseline VMT: To establish baseline VMT, we use recent VMT data and apply projections for population growth for the South Kauai Planning District.

Assumptions:
1. Total VMT reduction in Koloa/Paipu area will be 13% by 2035. This will result from a combination of bike, ped, transit programs (including this project) and increased housing development density.
2. Project assumption is that 15% of Koloa/Paipu mode shift will result from full set of Paipu Road improvements identified in the BUILD project after 3 years (2025)
3. Koloa/Paipu area total VMT reduction (method 1) calculated as follows: total island wide vmt x 0.94 x 0.15 x 0.15 x 0.15 x 0.15 = project attribution
4. See sheet 3 for secondary VMT reduction calculation (method 2)

Population growth assumed to follow island wide population

<table>
<thead>
<tr>
<th>Year</th>
<th>VMT Growth</th>
<th>tons CO2 (assumes no change in vehicle efficiency)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2019</td>
<td>0.0</td>
<td>5,000,000</td>
</tr>
<tr>
<td>2020</td>
<td>0.0</td>
<td>5,000,000</td>
</tr>
<tr>
<td>2021</td>
<td>0.0</td>
<td>5,000,000</td>
</tr>
<tr>
<td>2022</td>
<td>0.0</td>
<td>5,000,000</td>
</tr>
<tr>
<td>2023</td>
<td>0.0</td>
<td>5,000,000</td>
</tr>
<tr>
<td>2024</td>
<td>0.0</td>
<td>5,000,000</td>
</tr>
<tr>
<td>2025</td>
<td>0.0</td>
<td>5,000,000</td>
</tr>
<tr>
<td>2026</td>
<td>0.0</td>
<td>5,000,000</td>
</tr>
<tr>
<td>2027</td>
<td>0.0</td>
<td>5,000,000</td>
</tr>
<tr>
<td>2028</td>
<td>0.0</td>
<td>5,000,000</td>
</tr>
<tr>
<td>2029</td>
<td>0.0</td>
<td>5,000,000</td>
</tr>
<tr>
<td>2030</td>
<td>0.0</td>
<td>5,000,000</td>
</tr>
<tr>
<td>2031</td>
<td>0.0</td>
<td>5,000,000</td>
</tr>
<tr>
<td>2032</td>
<td>0.0</td>
<td>5,000,000</td>
</tr>
<tr>
<td>2033</td>
<td>0.0</td>
<td>5,000,000</td>
</tr>
<tr>
<td>2034</td>
<td>0.0</td>
<td>5,000,000</td>
</tr>
<tr>
<td>2035</td>
<td>0.0</td>
<td>5,000,000</td>
</tr>
<tr>
<td>2036</td>
<td>0.0</td>
<td>5,000,000</td>
</tr>
<tr>
<td>2037</td>
<td>0.0</td>
<td>5,000,000</td>
</tr>
<tr>
<td>2038</td>
<td>0.0</td>
<td>5,000,000</td>
</tr>
<tr>
<td>2039</td>
<td>0.0</td>
<td>5,000,000</td>
</tr>
<tr>
<td>2040</td>
<td>0.0</td>
<td>5,000,000</td>
</tr>
<tr>
<td>2041</td>
<td>0.0</td>
<td>5,000,000</td>
</tr>
<tr>
<td>2042</td>
<td>0.0</td>
<td>5,000,000</td>
</tr>
</tbody>
</table>

**GHG Reduced**

<table>
<thead>
<tr>
<th>Year</th>
<th>GHG Reduced</th>
<th>tons CO2 (assumes no change in vehicle efficiency)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2019</td>
<td>0.0</td>
<td>5,000,000</td>
</tr>
<tr>
<td>2020</td>
<td>0.0</td>
<td>5,000,000</td>
</tr>
<tr>
<td>2021</td>
<td>0.0</td>
<td>5,000,000</td>
</tr>
<tr>
<td>2022</td>
<td>0.0</td>
<td>5,000,000</td>
</tr>
<tr>
<td>2023</td>
<td>0.0</td>
<td>5,000,000</td>
</tr>
<tr>
<td>2024</td>
<td>0.0</td>
<td>5,000,000</td>
</tr>
<tr>
<td>2025</td>
<td>0.0</td>
<td>5,000,000</td>
</tr>
<tr>
<td>2026</td>
<td>0.0</td>
<td>5,000,000</td>
</tr>
<tr>
<td>2027</td>
<td>0.0</td>
<td>5,000,000</td>
</tr>
<tr>
<td>2028</td>
<td>0.0</td>
<td>5,000,000</td>
</tr>
<tr>
<td>2029</td>
<td>0.0</td>
<td>5,000,000</td>
</tr>
<tr>
<td>2030</td>
<td>0.0</td>
<td>5,000,000</td>
</tr>
<tr>
<td>2031</td>
<td>0.0</td>
<td>5,000,000</td>
</tr>
<tr>
<td>2032</td>
<td>0.0</td>
<td>5,000,000</td>
</tr>
<tr>
<td>2033</td>
<td>0.0</td>
<td>5,000,000</td>
</tr>
<tr>
<td>2034</td>
<td>0.0</td>
<td>5,000,000</td>
</tr>
<tr>
<td>2035</td>
<td>0.0</td>
<td>5,000,000</td>
</tr>
<tr>
<td>2036</td>
<td>0.0</td>
<td>5,000,000</td>
</tr>
<tr>
<td>2037</td>
<td>0.0</td>
<td>5,000,000</td>
</tr>
<tr>
<td>2038</td>
<td>0.0</td>
<td>5,000,000</td>
</tr>
<tr>
<td>2039</td>
<td>0.0</td>
<td>5,000,000</td>
</tr>
<tr>
<td>2040</td>
<td>0.0</td>
<td>5,000,000</td>
</tr>
<tr>
<td>2041</td>
<td>0.0</td>
<td>5,000,000</td>
</tr>
<tr>
<td>2042</td>
<td>0.0</td>
<td>5,000,000</td>
</tr>
</tbody>
</table>
## Methodology to Estimate Value of VMT Reduction

### Project VMT Reduction

<table>
<thead>
<tr>
<th>VMT costs</th>
<th>amount</th>
<th>units</th>
<th>amount</th>
<th>units</th>
<th>unit value</th>
<th>total value</th>
<th>data source</th>
</tr>
</thead>
<tbody>
<tr>
<td>per mile LDV O&amp;M</td>
<td>0.41</td>
<td>dollars/mile</td>
<td>0.41</td>
<td>$/mile</td>
<td>2,123,953</td>
<td>$870,821</td>
<td>appendix table A-5</td>
</tr>
<tr>
<td>CO2</td>
<td>368</td>
<td>grams/mile</td>
<td>861</td>
<td>tons</td>
<td>1 $</td>
<td>$861</td>
<td></td>
</tr>
<tr>
<td>NOx</td>
<td>1.034</td>
<td>grams/mile</td>
<td>2.419</td>
<td>tons</td>
<td>2,100</td>
<td>$5,079</td>
<td>page visit 5/1/2020</td>
</tr>
<tr>
<td>VOCs</td>
<td>0.693</td>
<td>grams/mile</td>
<td>1.621</td>
<td>tons</td>
<td>8,600</td>
<td>$13,941</td>
<td></td>
</tr>
<tr>
<td>PM 2.5</td>
<td>0.0041</td>
<td>grams/mile</td>
<td>0.01</td>
<td>tons</td>
<td>$387,300</td>
<td>$3,714</td>
<td></td>
</tr>
<tr>
<td>SO2</td>
<td>n/a for LDVs</td>
<td>grams/mile</td>
<td>n/a</td>
<td>tons</td>
<td>$50,100</td>
<td>$0</td>
<td>from zero in 2022 to $894,416 in 2025</td>
</tr>
</tbody>
</table>


[2] https://nepis.epa.gov/Exe/ZyPDF.cgi/P100EVXP.PDF?Dockey=P100EVXP.PDF
## Road segment VMT (from Poipu Road Multimodal Improvements TIAR Fig. 2.3 Austin Tsutsumi)

<table>
<thead>
<tr>
<th>Segment</th>
<th>Length</th>
<th>ADT</th>
<th>VFT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Old Poipu Sec 1</td>
<td>3300</td>
<td>8564</td>
<td>28261200</td>
</tr>
<tr>
<td>Old Poipu Sec 2</td>
<td>4200</td>
<td>7970</td>
<td>33474000</td>
</tr>
<tr>
<td>N Poipu 2-3</td>
<td>1950</td>
<td>10990</td>
<td>21430500</td>
</tr>
<tr>
<td>N Poipu 3-4</td>
<td>1300</td>
<td>9931</td>
<td>12910300</td>
</tr>
<tr>
<td>N Poipu 4-5</td>
<td>2400</td>
<td>8920</td>
<td>21408000</td>
</tr>
<tr>
<td>N Poipu 5-6</td>
<td>2600</td>
<td>5370</td>
<td>13962000</td>
</tr>
<tr>
<td>N Poipu 6-Hyatt</td>
<td>2300</td>
<td>3500</td>
<td>8050000</td>
</tr>
<tr>
<td>Total</td>
<td>18050</td>
<td></td>
<td>139496000</td>
</tr>
</tbody>
</table>

VMT reduction calculation (method 2)

roadway ADT x roadway length x 365 days/year x estimated project VMT reduction percentage

7728 3.42 miles x 365 days/year 20% reduction equals 1,928,638 vehicle miles travelled
### Methodology to Estimate Project VMT Reduction

**Baseline VMT:** To establish baseline VMT, we use recent VMT data and apply projections for population growth for the South Kauai Planning District.

1. Kauai projected 19% growth in VMT 2010 to 2035 in a baseline scenario vs zero growth in a ‘preferred’ scenario. Kauai MLTP pg 5-2
2. We assume per capita VMT is unchanged in the baseline scenario thru 2035 and all VMT growth is due to population growth. Kauai MLTP pg 5-4

**Assumptions:**

1. Total VMT reduction in Koloa/Poipu area will be 19% by 2035. This will result from a combination of bike, ped, transit programs (including this project) and increased housing development density.
2. Project assumption is that 15% of Koloa/Poipu mode shift will result from full set of Poipu Road improvements identified in the BUILD project after 3 years (2025)
3. Poipu/Koloa area total VMT reduction (method 1) calculated as follows: total island wide vmt x %of daytime population for Poipu/Koloa x 19% x 15.48% project attribution
4. See sheet 3 for secondary VMT reduction calculation (method 2)

**2010 baseline VMT from Kauai MMLP Plan. All other years calculated based on population increase**


Population growth assumed to follow island wide population 1.10%
Methodology for Discounting Project Costs

Project Costs (without discounting) total of $22,626,000. This includes a requested $20,363,400 in BUILD funding and a local match of $2,262,600. Discounting is applied to the costs above.

<table>
<thead>
<tr>
<th>Year</th>
<th>Project Year</th>
<th>Cost without Discounting</th>
<th>Present Value of Future Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>2020</td>
<td>0</td>
<td>$7,401,028</td>
<td></td>
</tr>
<tr>
<td>2021</td>
<td>1</td>
<td>$7,919,100</td>
<td>$7,401,028</td>
</tr>
<tr>
<td>2022</td>
<td>2</td>
<td>$11,857,455</td>
<td>$11,857,455</td>
</tr>
<tr>
<td>2023</td>
<td>3</td>
<td>$923,478</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>$22,626,000</td>
<td>$20,181,961</td>
</tr>
</tbody>
</table>

The following formula should be used to discount future benefits and costs:

\[ PV = \frac{FV}{(1 + i)^t} \]

Where:
- \( PV \) = Present discounted value of a future payment from year \( t \)
- \( FV \) = Future value of payment in real dollars (i.e., dollars that have the same purchasing power as in the base year of the analysis, see the next section for further discussion on this topic) in year \( t \)
- \( i \) = Real discount rate applied (7%)
- \( t \) = Years in the future for payment (where base year of analysis is \( t = 0 \))